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March 15, 2002

Carol Ropski  
U.S. Environmental Protection Agency  
Emergency Enforcement & Support Section, SE-5J  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

Re: Request for Information  
Downers Grove Groundwater Site  
Downers Grove, DuPage County, Illinois

Dear Ms. Ropski:

By letter dated January 30, 2002, the U.S. Environmental Protection Agency sought information regarding the Downers Grove Groundwater Site in DuPage County, Illinois. Letters were sent to J.L. Clark at two addresses: (1) 6809 Armstrong Court, Woodbridge, IL 60517, and (2) Atlas II Division, 2300 S. 6<sup>th</sup> Street, Rockford, IL 61125. EPA sought a response within 21 days of receipt of the request for information. By letter to EPA dated February 20, 2002, Arthur A. Vogel, Jr. of Quarles & Brady LLP confirmed an extension of the deadline for response to March 15.

As described in greater detail below, a division of J.L. Clark known as "Atlas Tube" operated a facility in Downers Grove from 1967 to 1997. The facility was located at 2300 Wisconsin Avenue in the Ellsworth Industrial Park. This letter responds to EPA's inquiries regarding operations at that location. It constitutes the response of J.L. Clark to both requests for information, i.e., the letter sent to J.L. Clark in Woodbridge and the letter sent to J.L. Clark in Rockford. (The address in Woodbridge, by the way, relates to a J.L. Clark sales representative. It has no connection to manufacturing in the Ellsworth Industrial Park and need not be used in future communications.)

References to the "Facility" mean the building and property owned by J.L. Clark at 2300 Wisconsin Avenue, Downers Grove, Illinois. A more detailed legal description is provided below. References to the "Company" mean J.L. Clark, including its Atlas Tube operation until 1997.

As explained in greater detail below, the Company no longer has any connection to the Facility. Assets of the Atlas Tube division were sold in 1997. The Facility itself was sold in

1998. Records relating to operation of the Facility, to the extent retained by the Company, were identified for purposes of this response.

We understand that private wells in the vicinity of the Ellsworth Industrial Park reveal the presence of trichloroethylene (TCE) and tetrachloroethylene (PCE) in excess of maximum contaminant levels for those substances. The Company retained, and produces with this response, material safety data sheets (MSDSs) for materials present at the Facility. These records, and those relating to hazardous waste disposal (which are also produced with this response), reflect the presence of various solvents, including acetone, toluene, MEK, mineral spirits and stoddard solvents in operations at the Facility. There are occasional references to 1,1,1-trichloroethane (TCA), but nothing that we have seen to suggest the usage or presence of TCE or PCE in operations at the Facility during ownership by J.L. Clark.

A specific response to EPA's request for information follows.

**1. Identify all persons consulted in the preparation of the answers to these Information Requests.**

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**2. Identify all documents consulted, examined, or referred to in the preparation of the answers to these Requests, and provide copies of all such documents.**

As described in further detail below, the "Atlas Tube" business was sold in 1997. Certain records were retained, however, by J.L. Clark. A general review of documents relating to Atlas Tube, most of which involved environmental matters, was undertaken for this response. Specifically, documents were identified in the following categories:

Material Safety Data Sheets  
Hazardous Waste Manifests/Annual Reports  
Annual Air Emission Reports  
Form R Reports  
Tier II Reports  
Hazardous Air Pollutant Reports  
Air Permits  
Coatings - VOCs  
Asbestos  
Solvent Management Plan  
Miscellaneous Air and EPCRA Reports

In addition, records relating to business and real estate transactions associated with the purchase and sale of the Facility were reviewed. Records responsive to specific requests are described below. Copies are provided as instructed in the request for information.

**3. If you have reason to believe that there may be persons able to provide a more detailed or complete response to any Information Request or who may be able to provide additional responsive documents, identify such persons.**

J.L. Clark has not had any contact with, or responsibility for, the Facility since selling the Atlas Tube business in 1997 and the Facility itself in 1998. Information on successors to J.L. Clark at the Facility can be found in response to Item 7 below.

**4. Identify all persons having knowledge or information about the generation, transportation, treatment, disposal, or other handling of hazardous substances by you, your contractors, or by prior owners and/operators.**

Former employees who worked at, or had some contact with, the Facility include the following:

Al Moore

Production Superintendent

Dean Dodson	Production Supervisor
John Benton	Plant Manager
Bill Pruyne	Purchasing
Dick Anderson	Plant Manager
Jim Klotz	Environmental Manager
Glenn Ceckowski	Chemist
Greg Gann	V.P. Operations (J.L. Clark)

5. **Between 1950 and the present, did you ever use, purchase, store, treat, dispose, transport or otherwise handle any hazardous substances or materials (including chlorinated solvents) at any location in the Ellsworth Industrial Park? If the answer to the preceding question is anything but an unqualified "no", identify:**

- a) **The chemical composition, characteristics, physical state (e.g., solid, liquid) of each hazardous substance;**

The Company used a variety of materials for which it obtained Material Safety Data Sheets (MSDSs). The contents of a binder containing MSDSs on hand at the time J.L. Clark ceased operations in 1997 have been copied and are included as Appendix A. For each substance, the MSDS identifies chemical characteristics. A separate compilation of "obsolete" MSDSs found in Company files is provided as Appendix B.

In addition, copies of the Company's "Tier Two" reports under the Emergency Planning and Community Right to Know Act are attached as Appendix C. This material includes a 1989 letter to the Illinois Department of Labor with a list of MSDSs for the Facility.

The Company also evaluated the composition of various coatings for purposes ranging from potential air emissions to product performance. Records relevant to these analyses are produced in Appendix D.

- b) **Who supplied you with such hazardous substances;**

For substances identified in Item 5.a., the MSDS identifies its manufacturer.

- c) **How such hazardous substances were used, purchased, generated, stored, treated, transported, disposed, or otherwise handled by you;**



At this point in time, several years after J.L. Clark ceased operations at the Facility, it is difficult to reconstruct exactly where and how such materials were used. As noted above, Appendix A contains a compilation of Material Safety Data Sheets. Appendix A also contains a list showing where materials were used in the Facility. The location where used, in turn, suggests how the materials were used as well.

Attached as Appendix E is a collection of "Solvent Management Plans" (the "Plan") prepared for the Downer's Grove Sanitary District (and related correspondence). These documents confirm that there was no bulk storage of "solvents" or "toxic organics" nor were there any "distribution lines" for such materials. Materials were generally stored in containers ranging from 5-gallon pails to 55-gallon drums and were generally taken to production areas by hand in 5-gallon containers. (In the last few years of operation, i.e., 1995-97, a product used in coatings was stored in 300-gallon totes.) Storage locations are described in the Plan and are shown on the "plant layout" attached to the 1992 Plan.

According to the 1992 and 1995 Plans, oily condensate water was picked up and hauled to Beaver Oil, 6037 Lenzi Avenue, Hodgkins, Illinois 60625, where the oil was separated from water and introduced into a fuel. Hazardous waste was picked up by Avganic Waste Solvent (Hydrite), 114 North Main Street, Cottage Grove, Wisconsin, where it was refined for further use or introduced into a fuel program.

A Solvent Management Plan from 1986 is also provided in Appendix E. This plan indicates that waste oil was picked up and hauled to Motor Oils Refining Company, 7601 W. 47<sup>th</sup> Street, McCook, Illinois. Hazardous waste was taken to American Chemical Service, 420 S. Colfax, Griffith, Indiana, where it was refined. (The Company, by the way, participated in a Superfund settlement regarding the American Chemical Services site.)

Copies of all hazardous waste manifests and annual reports are provided as Appendix F. According to these records, the following disposal/recycling facilities were used at one time or another during the 1980s and 90s:

Mahzel Metals (scrap metal/lead dross)  
325 North Elizabeth Street  
Chicago, IL

Safety Kleen Corp.  
1500 East Villa Street  
Elgin, IL 60120

6050 Eagle Avenue  
Portage, IN 46368

633 East 138<sup>th</sup> Street  
Dolton, IL 60419

Breslube  
601 Riley Road  
Indiana

Peoria Disposal Company (lead brick)  
4349 Southport Road  
Peoria, IL 61615

LWD, Inc.  
OFF Highway 1523  
Calvert City, KY 42029

Waste Research & Reclamation  
5200 State Road 93  
Eau Claire, WI 54701

Winnebago Reclamation (asbestos)  
8403 Linden Wood Road  
Rockford, IL 61109

Additional information regarding transportation and disposal can be found in the records produced in Appendix F.

The Company undertook various asbestos abatement projects over the years. Relevant documentation can be found in Appendix G.

- d) When such hazardous substances were used, purchased, generated, stored, treated, transported, disposed, or otherwise handled by you;**

Materials such as those identified in response to Item 5.a. were used at one time or another, particularly in the 1980s and 1990s. The dated Solvent Management Plans provided in Appendix E, and the Tier Two reports in Appendix C, also reflect when such materials were used. In addition, certain purchasing records, i.e., like purchase orders between roughly 1992 and 1997, are available electronically and can be provided if necessary after review of materials enclosed with this response.

- e) Where such hazardous substances were used, purchased, generated, stored, treated, transported, disposed, or otherwise handled by you; and**

See response to Item 5.c.

- f) The quantity of such hazardous substances used, purchased, generated, stored, treated, transported, disposed or otherwise handled by you.**

The volume of materials generally kept on site at any one time is reflected in the Solvent Management Plans provided as Appendix E.

**6. Describe the nature of your activities or business at the Site between 1950 and the present, with respect to purchasing, receiving, processing, storing, treating, disposing, or otherwise handling hazardous substances or materials at the Site.**

J.L. Clark conducted activities at the Facility between 1967 and 1997. Additional information regarding ownership/operation of the Facility is provided in response to Item 7 below. The primary manufacturing operation involved the production of collapsible "tubes" for sale to manufacturers of various consumer products (e.g., hair dyes, ointments, cream, toothpaste, etc.). Raw materials included an aluminum slug approximately one inch in diameter and ½ inch thick. The slug would be pounded and extruded into a tube. The tubing would be further manipulated by trimming and threading. Tube interiors would be sprayed with lacquer or a similar product and cured. Tube exteriors would be printed and cured. For many clients, a cap assembly would be prepared. The Company assembled its own corrugated boxes for shipping purposes. Finished tubes would be packaged in such boxes and shipped off site to customers.

For a period of time until the late 1980s or early 1990s, the Company made tubes out of lead as well as aluminum.

Documents prepared for the Food and Drug Administration (Drug Master File Type III Packaging Materials (1992) as revised (1994)) are provided as Appendix H. These documents also contain a detailed description of manufacturing operations and related requirements.

Materials for which MSDSs were maintained generally fall into the following categories: (a) lubricants/waxes for extruding tubes, (b) lacquers/coatings for tube interiors, (c) inks/coatings for printing on tube exteriors, and (d) maintenance related activities.

**7. State the dates during which you owned, operated, or leased a portion of the Site, and provide copies of all documents evidencing or relating to such ownership, operation, or lease arrangement (e.g., deeds, leases, etc.).**

J.L. Clark purchased Atlas Tube Company by agreement dated January 6, 1967. A copy of the 1967 Purchase Agreement is enclosed as Appendix I. J.L. Clark owned and operated the Facility until the sale of the tube-manufacturing business to CCL Tube Corporation by Asset Purchase Agreement dated November 10, 1997. A copy of the 1997 Asset Purchase Agreement is enclosed as Appendix J. CCL Tube vacated the premises in 1998.

J.L. Clark subsequently sold the Facility to MXL Industries, Inc. by Real Estate Sales Contract dated June 26, 1998, and a Deed made as of August 27, 1998. Copies of documents relating to this sale are provided as Appendix K.

J.L. Clark entered into a Lease Agreement with AT&T Wireless PCS, Inc. in approximately 1996 for a cell phone transmission tower, which lease was assigned to MXL Industries as of August 27, 1998.

**8. Provide information about any facilities you have ever owned or operated at the Site, including but not limited to the following:**

**a) Property boundaries, including a written legal description;**

The street address of the Facility is 2300 Wisconsin Avenue, Downers Grove, Illinois. The legal description is as follows:

Lot 1 in Frank Lopata Resubdivision of Lots 10, 11 and 12 in the Resubdivision of Lots 8 to 13, a subdivision in Ellsworth Park Unit Number 3 and Lot 24 in Ellsworth Park Unit Number 5, being a subdivision of part of the Southwest quarter and the Southeast quarter of Section 12, Township 38 North, Range 10, East of the Third Principal Meridian, according to the plat thereof recorded August 13, 1965 as Document R65-30445, in DuPage County, Illinois.

**b) Location of underground utilities (telephone, electrical, sewer, water main, etc.) and underground tanks;**

Several drawings of the Facility are provided in Appendix L. A drawing by R.G. Burkhardt and Associates dated April 12, 1960, and prepared for Da-Kay Enterprises, shows the location of various utilities. Water, gas and sanitary sewer lines enter the facility underground from the South along Wisconsin Avenue (f/k/a Junior Avenue). The building itself, we understand, was completed in 1962.

**c) Surface structures (e.g., buildings, tanks, etc.);**

See drawings in Appendix L.

**d) Groundwater wells, including drilling logs;**

None known.

**e) Stormwater drainage system, and sanitary sewer system, past and present, including septic tank(s), subsurface disposal field(s), and other underground structures; and where, when and how such systems are emptied;**

A storm sewer discharge is noted on the drawings provided in Appendix L along the northwest portion of the Facility.

- f) **Any and all additions, demolitions, or changes of any kind on, under, or about the Site, to its physical structures, or to the property itself (e.g., excavation work); and any planned additions, demolitions, or other changes to the Site; and**

None except the following: (i) in approximately 1988, an incinerator was added along the north side of the existing building, and (ii) in approximately 1996, AT&T Wireless installed a cell phone transmission tower at the Facility.

- g) **All maps and drawings of the Site in your possession.**

See material provided in Appendix E and Appendix L.

9. **Identify all past and present solid waste units (e.g., waste piles, landfills, surface impoundments, waste lagoons, waste ponds or pits, tanks, container storage areas, etc.) at any facility you owned or operated at the Site. For each such solid waste unit identified, provide the following information:**

- a) **A map showing the unit's boundaries and the location of all known solid waste units whether currently in operation or not. This map should be drawn to scale, if possible, and clearly indicate the location and size of all past and present units;**

See site plan attached to the 1992 Solvent Management Plan in Appendix E. This map reflects various raw material storage areas. Hazardous wastes were generally stored in the paint locker until shipment off-site. Oily condensate water from the compressors was removed from the receiving dock along the west side of the Facility. A container for solid waste disposal (cardboard, rubbish, etc.) was kept by the receiving dock along the west side of the Facility.

- b) **The type of unit (e.g., storage area, landfill, waste pile, etc.), and the dimensions of the unit;**

The only solid waste units known to the Company were for the collection and storage of waste materials until shipment off-site. There were no waste piles, landfills, surface impoundments, waste lagoons, waste ponds or pits, or tanks located at the Facility.

- c) **The dates that the unit was in use;**

Continuous throughout operation of the Facility.

- d) **The purpose and past usage (e.g., storage, spill containment, etc.);**

Collection of waste material for off-site shipment.

- e) **The quantity and types of materials (hazardous substances and any other chemicals) located in each unit; and**

See response to Item 5.

- f) **The construction (materials, composition), volume, size, dates of cleaning, and condition of each unit.**

Not applicable.

- g) **If unit is no longer in use, how was such unit closed and what actions were taken to prevent or address potential or actual releases of waste constituents from the unit.**

Waste attributable to the Company was removed off-site for disposal.

10. **Identify the prior owners or any property you owned or operated at the Site from 1950 to the present. For each prior owner, further identify: (a) the dates of ownership; (b) all evidence showing that they controlled access to the Site; and (c) all evidence that a hazardous substance, pollutant, or contaminant, was released or threatened to be released at the Site during the period that they owned the Site.**

As noted in response to Item 7 above, J.L. Clark purchased the facility by agreement dated January 6, 1967. See Appendix I. The prior owner was Atlas Tube Company and Da-Kay Enterprises, Inc., both Illinois corporations. In addition, the drawings provided in Appendix L dated 1960 were prepared for Da-Kay Enterprises. No further information is known about the status of prior owners nor the history of site operations.

11. **Identify the prior operators, including lessors, of any property you owned or operated at the Site from 1950 through the present. For each such operator, further identify: (a) the dates of operation; (b) the nature of prior operations at the Site; (c) all evidence that they controlled access to the Site; and (d) all evidence that a hazardous substance, pollutant, or contaminant was released or threatened to be released at or from the Site and/or its solid waste units during the period that they were operating the Site.**

See response to Item 10 above.

12. **Provide copies of all local, state, and federal environmental permits ever granted for your Facility or Facilities in the Ellsworth Industrial Park or any part thereof (e.g., RCRA permits, NPDES permits, etc.).**

Copies of various environmental permits and permit applications are provided in Appendix M.

- 13. Did your Facility or Facilities in the Ellsworth Industrial Park ever have "interim status" under RCRA? If so, and the Facility does not currently have interim status, describe the circumstances under which the Facility lost interim status.**

Attached as Appendix N are memos dated March 17 and March 16, 1981, respectively regarding a Hazardous Waste inspection of the Facility in 1981. The March 16 memo states that the Company "filed a part A application in error and subsequently notified E.P.A. region 5 that we are not a treatment, storage or disposal facility." As such, the Facility has only been identified as a generator for hazardous waste purposes.

- 14. Did your Facility or Facilities in the Ellsworth Industrial Park ever file a notification of hazardous waste activity under RCRA? If so, provide a copy of such notification.**

Yes, facility ID # ILD 005130000.

- 15. Provide all reports, information, or data related to soil, water (ground and surface), or air quality and geology/hydrogeology at and about the Site. Provide copies of all documents containing such data and information, including both past and current aerial photographs as well as documents containing analysis or interpretation of such data.**

There are no documents to our knowledge regarding soil and water quality at the Facility. Copies of documents relating to air quality include: (a) Form R Reports (Appendix O), (b) hazardous air pollutants (Appendix P), and (c) annual air emission reports (Appendix Q).

- 16. Identify all leaks, spills, or releases into the environment of any hazardous substances, pollutants, or contaminants (including chlorinated solvents) that have occurred at or from your Facility or Facilities at the Site. In addition, identify:**

- a) When such releases occurred;**
- b) How the releases occurred;**
- c) The amount of each hazardous substances, pollutants, or contaminants so released;**
- d) Where such releases occurred;**
- e) Any and all activities undertaken in response to each such release or threatened release, including the notification of any agencies or governmental units about the release.**

- f) Any and all investigations of the circumstances, nature, extent or location of each release or threatened release including, the results of any soil, water (ground and surface), or air testing undertaken; and**
- g) All persons with information relating to these releases.**

**Provide copies of all documents related to these leaks, spills or releases.**

**None known except permitted releases as reflected in Appendices O-Q.**

- 17. Was there ever a spill, leak, release or discharge of hazardous materials (including chlorinated solvents) into any subsurface disposal system or floor drain inside or under any building you own or operate at the Site? If the answer to the preceding question is anything but an unqualified "no," identify:**

- a) Where the disposal system or floor drains were located;**
- b) When the disposal system or floor drains were installed;**
- c) Whether the disposal system or floor drains were connected to pipes;**
- d) When such pipes were located and emptied;**
- e) When such pipes were installed;**
- f) How and when such pipes were replaced, or repaired; and**
- g) Whether such pipes ever leaked or in any way released hazardous materials into the environment.**

**Provide copies of all documents related to these leaks, spills or releases or discharges.**

**None known.**

- 18. Did any leaks, spills, or releases of hazardous materials (including chlorinated solvents) occur at any Facility you own or operate at the Site when such materials were being:**

- a) Delivered by a vendor;**
- b) Stored (e.g., in any tanks, drums, or barrels);**
- c) Transported or transferred (e.g., to or from any tanks, drums, barrels, or recovery units); or**



**d) Treated.**

If so, provide copies of all documents relating to these leaks, spills or releases.

None known.

**19. Has soil ever been excavated or removed from the Site: Unless the answer to the preceding question is anything besides an unequivocal "no," identify:**

- a) Amount of soil excavated;**
- b) Location of excavation;**
- c) Manner and place of disposal and/or storage of excavated soil;**
- d) Dates of soil excavation;**
- e) Identity of persons who excavated or removed the soil;**
- f) Reason for soil excavation;**
- g) Whether the excavation or removed soil contained hazardous materials and why the soil contained such materials;**
- h) Ann analyses or tests and results of analyses of the soil that was removed from the Site;**
- i) All persons, including contractors, with information about (a) through (h) of this request.**

**If so, provide copies of all documents relating to these excavations or removals.**

Soils were excavated in connection with the placement of footings for additions described in Item 8.f. above (incinerator and cell phone transmission tower). To the best of our knowledge, such soils were never analyzed and were left on site.

**20. Provide records from 1950 through the present showing how much chlorinated solvent/cleaner or other chlorinated materials were purchased for any Facility or Facilities you own or operate at the Site. Provide records from 1950 through the present, which show how much chlorinated solvent/cleaner or other chlorinated materials were sent from the Facility or Facilities you own or operate at the Site to be recycled or disposed. Provide the manifests showing such recycling or disposal.**

Hazardous waste manifest and annual reports are provided in Appendix F. See response to Item 5 above for further information regarding the volume and nature of such materials on site.

**21. Provide all records regarding the disposal of solid waste from the Facility or Facilities you own or operate at the Site from 1950 to present.**

In the late 1980s and early 1990s, solid waste was hauled off-site by ROT's Disposal, a Division of Browning-Ferris Industries. About 100 cubic yards of solid waste was generated at the Facility per month. Waste pickups were daily, 5 days a week. Available records are attached as Appendix R.

**Appendices**

<b><u>Identity</u></b>	<b><u>Description</u></b>	<b><u>Item # Responded to:</u></b>
A	Material Safety Data Sheets	5
B	Obsolete MSDSs	5
C	Tier Two Reports	5
D	Coatings – VOCs Analyses	5
E	Solvent Management Plans	5, 8, 9
F	Hazardous Waste Manifests/Reports	5, 20
G	Asbestos Documentation	5
H	FDA Documentation	6
I	1967 Purchase Agreement	7, 10
J	1997 Asset Purchase Agreement	7
K	1998 Real Estate Sale Documents	7
L	Facility Drawings	8, 10
M	Environmental Permits	12
N	Memos on 1981 HW Inspection	13
O	Form R Reports	15-16
P	Hazardous Air Pollutant Report	15-16
Q	Annual Air Emission Reports	15-16
R	Solid Waste Disposal Records	21

By providing this information, the Company is not, and shall not be construed as, admitting in any way that the Company is liable or responsible for damages or costs of any sort incurred by EPA or others relating to the Downers Grove Groundwater Site. The Company expressly reserves all rights and defenses at law or equity that may apply.

The information provided with this response, subject to inadvertent or undisclosed errors, is based upon, and therefore necessarily limited by, records and information still in existence, presently recollected and thus far discovered in the course of preparing these answers. The Company reserves the right to provide further information should more accurate information

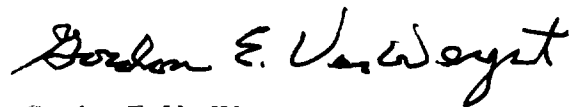
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become available at a later date. If information submitted as true is later found to be false, the Company will so advise EPA.

Please feel free to contact me at 815-961-5674 if you have questions about this response. Further communications regarding Atlas Tube should be directed to my attention at J.L. Clark, 923 23<sup>rd</sup> Avenue, Rockford, IL 61104.

Very truly yours,

**J.L. CLARK**

A handwritten signature in cursive script, reading "Gordon E. VerWeyst".

Gordon E. VerWeyst

Enclosures

# **Appendix A**

# LIST OF HAZARDOUS MATERIALS, CHEMICALS OR SUBSTANCES

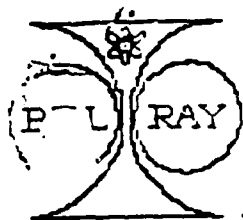
J. L. Clark Manufacturing Company/Atlas Tube Division uses the following materials, chemicals or substances in this facility which are listed or have ingredients listed on the Illinois Toxic Substances Disclosure to Employees List (Section 205, Table A of P.A.83-240) which have been determined hazardous. Their respective Material Safety Data Sheets follow. The material, chemical or substance is referenced with the specific department in which it is used.

PRODUCT/TRADE NAME	EXTRUSION/ SPRIMAG	DECORATING	MACHINE SHOP	2ND SHIFT
1. A cetylene			X	
2. Aluminum	X			X
3. Cellosolve Acetate	X			
4. Epoxy Phenol Lacquer	X			X
a. Hanna H-23 Tube Lacquer	X			X
b. Watson Std.27-015(GCR 300)Tube Lacquer	X			X
5. Epoxy Phenolic Lacquer	X			X
a. Hanna H-17 Tube Lacquer	X			X
b. Valspar S-5061-044 Tube Lacquer C.W SRQ 24-454	X			X
6. Ethyl Acetate		X		
7. Glycol Ether EE Acetate		X		
8. Hydrochloric Acid	X			X
9. Lead/Antimony Alloy	X			
10. Methyl Alcohol	FINISHING DEPT. - LABEL MAKER			
11. Methyl Ethyl Ketone	X			X
12. Modified Vinyl Enamel		X		X
a. Hanna Tube Enamels		X		X
13. Nitric Acid	X			X
14. Oxygen			X	
15. Paint-Off		X		
16. Petroleum Distillate/ Ink Reducer		X		X
17. Phenolic Lacquer	X			X
a. Watson Std.10-084A Tube Lacquer	X			X
b. Valspar 384-600C Tube Lacquer	X			X
c. Valspar S-1890-005 Tube Lacquer	X			X
18. Plasticized Vinyl Enamel		X		X
a. Sherwin William Tube Enamel		X		X
19. Propane	X		X	
20. Solvent #1902		X		X
21. Solvent/Thinner 10-084-AT	X			
22. Solvent/Stoddard, Mineral Spirits	X		X	
23. Solvent #660	X	X	X	X
24. Trichloroethane III			X	

<u>PRODUCT/TRADE NAME</u>	<u>EXTRUSION/ SPRIMAG</u>	<u>DECORATING</u>	<u>MACHINE SHOP</u>	<u>2ND SHIFT</u>
25. Tool Steel			X	
a. Rex AA (Knock-Outs)			X	
b. Airdi 150 (Bushings, Punch, Shanks & Tips)			X	
c. CPM Rex M4 (Press- Strippers)			X	
d. Carbide Grades VR65 & W588 (Tool-Bits)			X	
e. Tantung Grades (Tool- Bits)				
f. Tungsten Carbide Grades (Tool-Bits)			X	
g. Drill Rod (Spurs) SAE 01 & Sae W110			X	
26. Vinyl Lacquer	X			X
a. Hanna XR 1215 Tube Lacquer	X			X
b. Hanna XR 3472 Tube Lacquer	X			X
27. Welding Rods			X	
a. McKay Grade 7014			X	
b. Welco 15-15FC			X	
28. Zinc Stearate	X			X

LUBRICANTS  
09/02/97

MANUFACTURER	DATE	DESCRIPTION
BEL-RAY	03/31/88	MOLYLUBE ANTI-SIEZE
INGERSOL RAND	10/12/88	XL-740HT
SUMMIT OIL	03/22/88	I-R DSL-100
McCLAIN CORP.	06/24/85	#205 GRAPHITE
SAF-T-EZE	06/01/91	SAF-T-EZE MOLY
TOWER OIL	12/10/91	MOLYFILM HI-TEMP
TOWER OIL	10/30/87	46 WAY & GEAR
TOWER OIL		95 WAY & GEAR
TOWER OIL		DUROL E (DUROL 20)
TOWER OIL	06/22/87	GREZALL SOG
TOWER OIL	01/31/88	TOWERQUENCH 2
TOWER OIL	06/02/87	EXPRESS GEAR LUBE
TOWER OIL	11/04/87	TOWERCUT B-808
TOWER OIL	03/31/88	PENETRATING OIL
TOWER OIL	03/28/88	SUPER KOOL KLENE X 20
TOWER OIL		GREZALL H
TOWER OIL	06/02/87	HYDROIL AW-4
TOWER OIL	09/15/87	611 HI-TEMP LUBE
TOWER OIL	06/22/87	GREZALL RL-2



TOTAL PERFORMANCE  
LUBRICANTS

# MATERIAL SAFETY DATA SHEET

DATE: 880331

No. 168

BEL-RAY No. 1  
P. O. BOX 526  
FARMINGDALE  
N. J. 07727  
(201) 938-2421

## SECTION 1

PRODUCT NUMBER: 6770      PRODUCT NAME: MOLYLUBE ANTI-SEIZE  
CHEM. NAME: MIXTURE      CHEM. FAMILY: PETROLEUM HYDROCARBON GREASE  
FPA CODE: HEALTH-0      FIRE-1      REACTIVITY-0

## SECTION 2 - HAZARDOUS INGREDIENTS

Proprietary combination not tested as a whole for toxicological properties.  
Largely mineral oil with an established TLV of 5 mg/m<sup>3</sup> oil mist in air. Acute  
toxicity: essentially a non hazardous product, the most toxic component reports an  
oral rat LD50 of 7.49 g/kg and a dermal rabbit LD50 of 3.24 g/kg.

## SECTION 3 - PHYSICAL DATA

MELTING POINT: OVER 700	SPEC. GRAV.: APPROX. 1.23
VAPOR PRESSURE: LESS THAN 0.01	% VOLATILE: LESS THAN 1%
VAPOR DENSITY: GREATER THAN 20	EVAP. RATE: (ETHYL ETHER = 1) < 0.005
WATER SOLUBILITY: NEGLIGIBLE	ODOR: BURNT OIL
APPEARANCE: DARK GRAY TO BLACK GRS/PASTE	TLV: NOT ESTABLISHED

## SECTION 4 - FIRE & EXPLOSION HAZARD DATA

FLASH POINT: FOR BASE OIL; COC 550 DEG. F. UP FLAM. LMT: 6%  
EXT. MEDIA: WATER, FOAM, CO<sub>2</sub>, DRY CHEMICAL LOW FLAM LMT: 1%  
SPEC. FIRE FIGHTING PROC. 1: USE AIR SUPPLIED RESCUE EQUIPMENT FOR ENCLOSED  
2: AREAS.  
UNUSUAL FIRE & EXT. HAZ. 1: NONE  
2:

## SECTION 5 - STABILITY

STABILITY	: Stable
COMPATIBILITY	: Strong oxidants: concentrated oxygen & chlorine
POLYMERIZATION	: Will not occur
THERMAL DECOMPOSITION	: Smoke, CO, sulfur compound when ignited



**SECTION 6 - HEALTH HAZARD DATA****EFFECTS OF OVER EXPOSURE:**

NO KNOWN ADVERSE EFFECTS FROM CONTACT OR EXPOSURE.

**EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** GREASE - INHALATION NOT LIKELY TO OCCUR. CONSULT PHYSICIAN IF ANY POSSIBILITY THAT MATERIAL HAS BEEN ASPIRATED INTO LUNGS.

**INGESTION:** CONSULT PHYSICIAN. DO NOT INDUCE VOMITING. GIVE ONE GLASS OF WARM MILK.

**SKIN:** REMOVE CONTAMINATED CLOTHING. WASH AFFECTED SKIN AREAS WITH SOAP AND WATER.

**EYES:** FLUSH WITH WATER. CONSULT PHYSICIAN IF IRRITATION PERSISTS.

**SECTION 7 - SPECIAL PROTECTION PROCEDURES**

**VENTILATION PROCEDURE:** NOT NECESSARY

**RESPIRATORY PROTECTION:** OIL IMPERVIOUS, IF NEEDED

**EYE PROTECTION:** SPLASH PROOF GOGGLES, IF NEEDED

**OTHER PROTECTION:** USE GOOD INDUSTRIAL HYGIENIC PRACTICES

**SECTION 8 - SPILL AND LEAK PROCEDURES**

**CONTAIN AND RECOVER.** FOR LARGE SPILLS SHOVEL MATERIAL INTO CONTAINERS AND APPLY PROPER SOLVENTS AND ABSORBANTS TO EFFECT COMPLETE CLEAN UP.

**WASTE DISPOSAL METHOD**

USE LICENSED WASTE OIL DISPOSAL CONTRACTOR. SEE SECTION II WHICH LISTS COMPONENTS OF CONCERN TOWARDS COMPLIANCE W/RCRA 40 CFR 261.

**SECTION 9 - SPECIAL PRECAUTIONS**

STORE IN CLOSED CONTAINER TO AVOID CONTAMINATION.

"EMPTY" CONTAINERS RETAIN RESIDUE. DO NOT WELD, CUT, HEAT OR EXPOSE TO SPARKS OR OPEN FLAMES AS THEY MAY EXPLODE.

# XL-740HT

**INGERSOLL-RAND**  
**AIR COMPRESSORS**

## MATERIAL SAFETY DATA SHEET

**Effective Date:** 10/12/88

XL-740HT is a diester based synthetic lubricant specifically formulated for use in Ingersoll-Rand Type 40 Reciprocating Air Compressors, or other severe duty applications for large Ingersoll-Rand reciprocating air compressors.

**1.) PRODUCT IDENTIFICATION:** Mixture - Chemical Family: Diester

**2.) HAZARDOUS INGREDIENTS:** The components of this product are not listed as hazardous or toxic according to OSHA (29 CFR OSHA 1910.1200), NTP, IARC, and SARA 313.

**Hazardous Materials Identification System (HMIS):**

Health	Flammability	Reactivity	Base
0	1	0	...

**3.) PHYSICAL DATA:**

Boiling Point: Not established  
Vapor Pressure: Not established  
Vapor Density: Not established  
Solubility in Water: Nil  
Appearance: Clear bluish green fluid

Pour Point: -20° F  
Specific Gravity: 0.97 @ 15.5° C/15.5° C  
Percent Volatile: Negligible  
Evaporation Rate: Not established  
Odor: Mild ester odor

**4.) FIRE AND EXPLOSION HAZARD DATA:**

Flash Point: 525° F  
Method Used: COC  
Autoignition Temperature: 780° F  
Flammable Limits: Not established  
Fire Fighting Media: Water spray, dry chemical, foam or carbon dioxide  
Fire Fighting Procedures: Use water to keep fire-exposed container cool. Wear self-contained breathing apparatus and full turn gear to fight fire. Water or foam may cause frothing.  
Special Fire and Explosion Hazard: None expected

**5.) HEALTH HAZARD:**

Threshold Limit Value: Not established (Treat as mineral oil: 5mg/meter cubed)  
Effects on Exposure: Prolonged or repeated skin contact may tend to remove natural skin oils, thus leading to possible irritation and dermatitis.  
Medical Conditions Generally Aggravated by Exposure: May aggravate previous skin condition.  
Skin Contact: With repeated contact, a skin defatter. May develop redness or mild irritation.  
Skin Absorption: Not established  
Ingestion (Acute): Not established  
Inhalation (Acute): Not established  
Eyes: Mild irritation.  
Systemic & Other Effects: Not established

# XL-740HT™

## **INGERSOLL-RAND.** **AIR COMPRESSORS**

### **6.) REACTIVITY DATA:**

**Stability:** Stable. Will not react violently with water.

**Incompatibility:** Avoid contact with strong oxidizers, such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

**Hazardous Decomposition:** Burning will produce oxides of carbon.

**Hazardous Polymerization:** Will not occur.

**Conditions to Avoid:** Open flames.

---

### **7.) HANDLING PRECAUTIONS:**

**Exposure Guidelines:** Not established. OSHA TLV/TWA 5mg/m<sup>3</sup>oil mist can be used.

**Ventilation:** Local exhaust to capture vapor, mist or fumes, if necessary.

**Respiratory Protection:** Use NIOSH-approved equipment: filter, dust, fume or mist respirator under misty conditions.

**Skin Protection:** For prolonged use, use chemical resistant gloves to minimize skin contact.

**Eye Protection:** Use chemical splash goggles or safety glasses when contact may occur.

**Special Handling and Storage:** If splashing occurs, use apron. Do not get in eyes, on skin or clothing.

Wash thoroughly after handling.

---

### **8.) ENVIRONMENTAL AND DISPOSAL INFORMATION:**

**Steps to be Taken in Case of Spills:** Prevent spread of spill. Absorb with sand or an inert, absorbent material. Sweep or scoop up and remove.

**Waste Disposal Method:** Dispose of in accordance with local, state or federal laws.

---

### **9.) FIRST AID:**

**Eyes:** Flush with water for at least 15 minutes. Hold eyelids open while flushing. If irritation persists, get medical attention.

**Skin:** Remove contaminated clothing and wash skin thoroughly with soap and water.

**Ingestion:** Do not induce vomiting. Get medical attention immediately.

**Inhalation:** Remove to fresh air. Get medical attention if discomfort persists.

---

### **10.) PREPARED BY: Ingersoll-Rand Company**

**Note:** This information is furnished without warranty, representation, inducement or license of any kind, except that it is accurate to the best of Ingersoll-Rand's knowledge or obtained from sources believed by Ingersoll-Rand to be accurate, and Ingersoll-Rand does not assume any legal responsibility for use or reliance upon same. Customers are encouraged to conduct their own tests. Before using any product, READ ITS LABEL.

#### **Emergency Contact:**

Telephone: 704/896-4500

Telex: 572584 IRACDSN DYDS

800 A Beatty Street

Davidson, North Carolina 28036

APDD 289 A-90

**INGERSOLL-RAND.**  
**AIR COMPRESSORS**

\*\*\*\*\*  
\* MATERIAL SAFETY DATA SHEET \*  
\*\*\*\*\*

SUMMIT OIL CO., INC.  
2440 East Fifth Street  
Suite 120  
Tyler, Texas 75701  
(214) 593-6893

MAY 4 1988

ALLAS THERM DIV  
NEWARK, NJ

DATE: 03/22/88

REVISED: 03/22/88

SUPERSEDES: 05/11/87

-----  
I. PRODUCT IDENTIFICATION  
-----

Trade Name: Ingersoll-Rand DSL-100

Chief Constituent: Phthalate Esters

Hazardous Ingredients/OSHA: NONE

Carcinogenic Ingredients/OSHA/NTP/IARC: NONE

-----  
II. WARNING STATEMENTS  
-----

None

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III. PHYSICAL AND CHEMICAL DATA  
-----

Appearance and Odor: Red color with mild odor

Specific Gravity: < 1.0

Boiling Point: > 600 degrees F

Vapor Pressure: < .035 mm Hg @ 300 degrees F

-----  
IV. FIRE PROTECTION  
-----

Flash Point: > 450 degrees F (COC)

Extinguishing Media: Water spray, dry chemical, foam or CO2

Special Firefighting Procedure: Burning will produce toxic fumes.  
Wear self contained breathing apparatus and full turn out gear to  
fight fire. Avoid spreading liquid and fire by water flooding.

Unusual Fire Hazard: Exposure to heat builds up pressure in closed  
containers. Cool with water spray.

---

## IX. PROTECTION AND CONTROL MEASURES

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Protective Equipment: Impermeable gloves, splash goggles, eye wash and safety shower

Respiratory Protection: If overheated, use approved respiratory protective equipment.

Ventilation: Local exhaust and mechanical recommended

---

## X. EMERGENCY AND FIRST AID PROCEDURES

---

Eye Contact: Flush eyes with water for 15 minutes. Call a physician if irritation develops.

Skin Contact: Wash skin with soap and water.

Inhalation: Remove to fresh air. Give artificial respiration or oxygen if necessary.

Ingestion: Induce vomiting if victim is conscious. Call a physician.

---

## XI. SPILL AND DISPOSAL PROCEDURES

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### Environmental Impact:

Report spills as required to appropriate authorities. U.S. Coast Guard regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Report spill to Coast Guard Toll Free Number (800) 424-8802. In case of accident or road spill notify Chemtrec (800) 424-9300.

### Procedures if Material is Released or Spilled:

Absorb on fire retardent treated sawdust, diatomaceous earth, etc. Shovel up and dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulations, and product characteristics at time of disposal.

### Waste Management:

Dissolve waste in a solvent and dispose by supervised incineration in compliance with applicable laws and regulations.

### Toxic Substance Inventory Control Act:

All components are included on the TSCA Inventory and are in compliance with the TSCA.

**U.S. DEPARTMENT OF LABOR**  
Occupational Safety and Health Administration

Form Approved  
OMB No. 44-R1387

No. 17

1285413  
K11

(100)

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

<b>MANUFACTURER'S NAME</b> McClain Corporation		<b>EMERGENCY TELEPHONE NO.</b> 815 338 7500
<b>ADDRESS (Number, Street, City, State, and ZIP Code)</b> 304 West Jackson Street, Woodstock, IL 60098		
<b>CHEMICAL NAME AND SYNONYMS</b> Graphite		<b>TRADE NAME AND SYNONYMS</b> #205 Graphite
<b>CHEMICAL FAMILY</b> Carbon	<b>FORMULA</b> C	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS None			BASE METAL None		
CATALYST None			ALLOYS None		
VEHICLE None			METALLIC COATINGS None		
SOLVENTS None			FILLER METAL PLUS COATING OR CORE FLUX None		
ADDITIVES None			OTHERS None		
OTHERS None					
<b>HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES</b>				%	TLV (Units)
None					

## SECTION III - PHYSICAL DATA

<b>BOILING POINT (°F.)</b>	N.A.	<b>SPECIFIC GRAVITY (H<sub>2</sub>O=1)</b>	1.47 G/CM
<b>VAPOR PRESSURE (mm Hg.)</b>	N.A.	<b>PERCENT, VOLATILE BY VOLUME (%)</b>	2.5%
<b>VAPOR DENSITY (AIR=1)</b>	N.A.	<b>EVAPORATION RATE (_____ =1)</b>	N.A.
<b>SOLUBILITY IN WATER</b>	Insoluble		
<b>APPEARANCE AND ODOR</b> Black, Odorless			

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

<b>FLASH POINT (Method used)</b>	N.A.	<b>FLAMMABLE LIMITS</b>	Lel	Uel
		Not Known		
<b>EXTINGUISHING MEDIA</b> Carbon Dioxide Foam				
<b>SPECIAL FIRE FIGHTING PROCEDURES</b> None				
<b>UNUSUAL FIRE AND EXPLOSION HAZARDS</b> None				

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	15 MPPCF
EFFECTS OF OVEREXPOSURE	Data not available
EMERGENCY AND FIRST AID PROCEDURES	Data not available

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	None
INCOMPATABILITY (Materials to avoid)		None Known	
HAZARDOUS DECOMPOSITION PRODUCTS Carbon Monoxide will be evolved from incomplete combustion			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	None

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
Sweep up	
WASTE DISPOSAL METHOD	
Landfill	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (Specify type) dust mask		
Not compulsory, but is recommended for nuisance purposes when grinding or milling		
VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER
PROTECTIVE GLOVES	Not Necessary	Not Necessary
OTHER PROTECTIVE EQUIPMENT		Not Necessary

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
Avoid tearing bags or puncturing drums so that material spills which could cause housekeeping duties.	
OTHER PRECAUTIONS	
None	

1279K2,3,4

## MOLY GRADE

## Material Safety Data Sheet

May be used to comply with  
OSHA's Hazard Communication Standard  
29 CFR 1910.1200. Standard must be  
consulted for specific requirements.

## U.S. Department of Labor

Occupational Safety and Health Administration  
(Non-Mandatory Form)  
Form Approved  
OMB No. 1218-0072

NO: 168

IDENTITY (As Used on Label and List)

SAF-T-EZE MOLY GRADE ANTI-SEIZE

Note: Blank spaces are not permitted. If any item is not applicable, or  
no information is available, the space must be marked to  
indicate that.

## Section I

Manufacturer's Name

SAF-T-EZE DIV., STL COMPOUND CORPORATION

Emergency Telephone Number

(708) 971-1515

Address (Number, Street, City, State, and Zip Code)

300 EISENHOWER LANE NORTH

Telephone Number for Information

(708) 971-1515

Date Prepared

JUNE 1, 1991

LOMBARD, ILLINOIS 60148

Signature of Preparer (optional)

ENVIRONMENTAL HEALTH &amp; SAFETY

## Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Names(s))

OSHA PEL

ACGIH TLV

Other limits

Recommended

% (Optional)

None

## Section III - Physical/Chemical Characteristics

Boiling Point

600°F

Specific Gravity (H<sub>2</sub>O = 1)

0.9

Vapor Pressure (mm Hg.) @70°C

&lt;0.1

Melting Point

Nil

Vapor Density (AIR = 1)

N/A

Evaporation Rate  
(Butyl Acetate = 1)

N/A

Solubility in Water

Negligible

Appearance and Odor

Silver grey paste with very light odor

## Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)

C.O.C. &gt;360°F

Flammable Limits

LEL

N/A

UEL

N/A

Extinguishing Media

Foam, CO<sub>2</sub>, Dry chemicals

Special Fire Fighting Procedures

Water may be ineffective. Dense smoke may be generated while burning.

Use NIOSH approved respirator and protective clothing.

Unusual Fire and Explosion Hazards

Decomposition vapors may be harmful.



**Section V - Reactivity Data**

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials to Avoid)

Strong Oxidizing Agents

Hazardous Decomposition or Byproducts

CO, CO<sub>2</sub>, SO<sub>2</sub>

Hazardous Polymerization

May Occur

Conditions to Avoid

Will Not Occur

X

**Section VI - Health Hazard Data**

Route(s) of Entry:

Inhalation?

N/A

Skin?

Contact

Ingestion?

Contact

Health Hazards (Acute and Chronic)

None known

Carcinogenicity:

NTP?

NO

IARC Monographs?

NO

OSHA Regulated?

NO

Signs and Symptoms of Exposure

EYE IRRITATION: Prolonged or repeated contact may lead to skin irritation in

Some individuals.

Medical Conditions

Generally Aggravated by Exposure

May aggravate pre-existing skin disorders.

First Aid and First Aid Procedures

EYES: Flush thoroughly with water, get medical attention. SKIN: Wash with soap and water. INGESTION: No ill effects expected for small amount.

**Section VII - Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material is Released or Spilled

Remove any source of ignition. Scoop up as much as possible, cover

the remainder with an oil absorbant such as sand, earth or sweeping compound..

Waste Disposal Method

Dispose of at an approved waste disposal terminal.

Precautions to Be Taken in Handling and Storing

Store away from sparks, open flames or excessive heat.

Other Precautions

Use normal good industrial hygienic practices.

**Section VIII - Control Measures**

Respiratory Protection (Specify Type)

N/A

Ventilation

Local Exhaust

N/A

Special

N/A

Mechanical (General)

N/A

Other

N/A

Protective Gloves

Yes, oil resistant

Eye Protection

Safety glasses or chemical goggles

Protective Clothing or Equipment

To prevent skin contact

Hygienic Practices

Normal good industrial hygiene, wash hands before meals and at end of shift.

The information on this data sheet represents our current data and best opinion as to the proper use in handling of this product under normal conditions. Any use of the product which is not in conformance with this data sheet or which involves using the product in combination with any other product or any other process is the responsibility of the user.

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY COMPANY  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: MOLYFILM HI-TEMP LUBE 4AA  
CHEMICAL NAME: N/A  
CHEMICAL FAMILY: PETROLEUM HYDROCARBON  
FORMULA: N/A  
  
INFORMATION PHONE: 1-312-346-0562  
EMERGENCY PHONE: 1-800-424-8900 (CHEMTREC)

**HMIS/NFPA HAZARD**

HEALTH:	1
FLAMMABILITY:	1
REACTIVITY:	0

## I. PHYSICAL DATA

BOILING POINT:	N/A
VAPOR PRESSURE:	<0.01 mm Hg
SOLUBILITY IN WATER:	Insoluble
EVAPORATION RATE:	<0.01 (BA = 1)
SPECIFIC GRAVITY:	0.87 (WATER = 1)
PERCENT VOLATILE BY VOLUME:	Negligible
APPEARANCE:	Dark gray liquid.
ODOR:	Mild petroleum
VISCOSITY:	Typical 38 SUS @ 100°F
VAPOR DENSITY:	>5 (AIR = 1)

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
NONE	-	-	-	-

## III. FIRE AND EXPLOSION DATA

FLASH POINT: Typical 215°F COC

FLAMMABLE LIMITS - LOWER: 0.6% UPPER: 7.0%

**EXTINGUISHING MEDIA:**

Foam, carbon dioxide, dry chemicals, water fog or spray.

**SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to cool containers and prevent rupture. If a spill has not ignited, use water spray to disperse vapors. Minimize breathing fumes. Employ supplied-air breathing equipment in confined areas.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Treat as oil fire.

Post-It™ brand fax transmittal memo 7671

# of pages = 4

To Larry Zapfel	From Kurt Scupin
Co. J.L. Clark	Co.
Dept.	Phone #
Fax # (708) 969-8823	Fax # (708) 346-6873

MOLYFILM HI-TEMP LUBE 4AA

PAGE 2

#### **IV. REACTIVITY DATA**

**STABILITY:** Stable

**CONDITIONS TO AVOID:** N/A

**INCOMPATIBILITY:** Strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal - carbon monoxide, carbon dioxide, sulfur oxides in the case of incomplete combustion.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** N/A

#### **V. HEALTH HAZARD DATA**

**TLV (THRESHOLD LIMIT VALUE):** 5mg/m3 as oil mist in air.

##### **-EFFECTS OF OVEREXPOSURE-**

**ACUTE:**

Possible skin and eye irritation. Low order of oral toxicity.

**CHRONIC:**

Prolonged or repeated skin contact may tend to remove natural oils, resulting in development of dermatitis.

**CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC, or OSHA.

##### **-EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air. Get medical attention.

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 minutes or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and mild soap. Remove contaminated clothing.

#### **VI. SPILL AND LEAK PROCEDURES**

**IF MATERIAL IS RELEASED OR SPILLED:**

Contain spill and transfer to suitable containers or soak up in absorbent medium. If spill enters sewer, notify Authorities.

**WASTE DISPOSAL:**

Employ contract service. Disposal procedure must be in accordance with Local, State, and Federal Regulations.

MOLYFILM HI-TEMP LUBE 4AA

PAGE 3

**VII. SPECIAL PROTECTION INFORMATION****RESPIRATORY PROTECTION:** Not normally required.**-VENTILATION-****LOCAL EXHAUST:** N/A**SPECIAL:** N/A**MECHANICAL (GENERAL):** N/A**OTHER:** N/A**PROTECTIVE GLOVES:** Rubber, neoprene.**EYE PROTECTION:** Splash goggles. Face shield.**OTHER PROTECTIVE EQUIPMENT:**

Oil resistant apron if needed to avoid prolonged or repeated skin contact.

**VIII. SPECIAL PRECAUTIONS****PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:**

Keep containers closed when not in use. Do not handle or store near ignition sources or strong oxidants. Protect from freezing temperatures. Personnel in close vicinity of misted product above TLV should wear approved breathing devices.

**PERSONAL HYGIENE** - Minimize breathing hot vapors. Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.**IX. ENVIRONMENTAL REGULATIONS/FEDERAL EPA****SARA III** (Superfund Amendment and Reauthorization Act of 1986)

40 CFR Part 372 and 40 CFR Part 355

Sections 302, 304 and 40 CFR 355 - Extremely Hazardous Substances:

COMPONENT	%	RQ (lbs.)	TPQ (lbs.)	CAS #
NONE	-	-	-	-

Sections 311, 312 and 40 CFR 355 - Hazard Categories:

ACUTE (IMMEDIATE HEALTH HAZARD):	YES	FIRE HAZARD:	YES
CHRONIC (DELAYED HEALTH HAZARD):	YES	REACTIVE HAZARD:	N/A
SUDDEN PRESSURE RELEASE:	N/A		

Section 313 and 40 CFR Part 372 - Toxic Chemicals:

COMPONENT	%	CAS #
NONE	-	-

**CERCLA** (Comprehensive Environmental Response, Compensation and Liability Act)

Section 102 - Hazardous Substances:

COMPONENT	%	RQ (lbs.)	CAS #
NONE	-	-	-

**CLEAN WATER ACT**

Under section 311 (b) (4) of this act, contamination of surface waters by petroleum products must be reported immediately to the National Response Center.

SECTION 311 (b) (4) DOES APPLY TO MOLYFILM HI-TEMP LUBE 4AA.

MOLYFILM HI-TEMP LUBE 4AA

PAGE 4

**X. STATE RIGHT-TO-KNOW****TSCA (Toxic Substances Control Act) Status**

All components of this formula are included in the TSCA Inventory.

**HMIS/NFPA HAZARD: 4 = SEVERE 3 = SERIOUS 2 = MODERATE 1 = SLIGHT 0 = MINIMAL****N/D = NOT DETERMINED N/A = NOT APPLICABLE < = LESS THAN > = GREATER THAN**

*The information appearing in this document is based upon data obtained from raw material manufacturers and/or recognized technical sources. While this information is believed to be correct, TOWER OIL & TECHNOLOGY makes no representations as to its accuracy or sufficiency, usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use, and users are responsible for the verification of this information under their own operating conditions to determine whether the product is suitable for their particular purposes, and these users assume all risks of their use, handling, and disposal of the product. This information relates only to the product designated above and does not relate to its use in combination with any other material in any other process.*

**TOWER OIL & TECHNOLOGY CO.****December 10, 1991**

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: #46 WAY & GEAR LUBE

CHEMICAL NAME: N/A

CHEMICAL FAMILY: PETROLEUM HYDROCARBON.

FORMULA: N/A

* N.F.P.A.	:
FIRE: 1	:
HEALTH: 1	:
REACTIVITY: 0	:

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: 550 S.U.S. @ 100F.

VAPOR PRESSURE (mm Hg): <0.01

VAPOR DENSITY (AIR = 1): >1.0

SOLUBILITY IN WATER: Negligible.

EVAPORATION RATE: (BA = 1) Negligible.

SPECIFIC GRAVITY (WATER = 1): 0.9

PERCENT VOLATILE BY VOLUME: Negligible.

APPEARANCE AND ODOR: Dark amber liquid. Mild petroleum odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

### ***III. FIRE AND EXPLOSION HAZARD DATA***

FLASH POINT: 315F. C.O.C.

FLAMMABLE LIMITS- LOWER: 0.9

UPPER: 7.0

#### **EXTINGUISHING MEDIA:**

Foam, dry chemical, water spray, water fog, CO2.

#### **SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to keep containers cool and prevent rupture. If spill has not ignited use water spray to disperse vapors. Minimize breathing fumes. Employ supplied-air breathing equipment in confined areas.

#### **UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Treat as oil fire.

### ***IV. REACTIVITY DATA***

STABILITY: Stable.

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY: Strong oxidizing agents.

#### **HAZARDOUS DECOMPOSITION PRODUCTS:**

Carbon monoxide, sulfur oxides in the case of incomplete combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: N/A

### ***V. HEALTH HAZARD DATA***

TLV (THRESHOLD LIMIT VALUE): 5mg/m3 as oil mist in air.

## **EFFECTS OF OVEREXPOSURE-**

### **ACUTE:**

Possible eye and skin irritation. Low order of oral toxicity.

### **CHRONIC:**

Prolonged or repeated skin contact may tend to remove natural oils resulting in development of dermatitis.

### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air. Call MD.

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and soap. Remove contaminated clothing.

## ***VI. SPILL AND LEAK PROCEDURES***

### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. If spill enters sewer notify Authorities.

### **WASTE DISPOSAL:**

Employ Contract Service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** Not normally required.

### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:**

4-11-11



PROTECTIVE GLOVES: Chemical and oil resistant.

EYE PROTECTION: Splash goggles. Face shield.

OTHER PROTECTIVE EQUIPMENT:

Chemical resistant apron if needed to avoid prolonged skin contact.

#### VIII. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Do not handle or store near ignition sources or strong oxidants. Avoid exposure to freezing temperatures. Personnel in close vicinity of oil mists above TLV should wear approved breathing devices

PERSONAL HYGIENE. Minimize breathing vapors. Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.

\* HAZARD RATINGS:      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

TOWER OIL & TECHNOLOGY CO.

October 30, 1987

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

FORM APPROVED  
OSHA NO. 10-11357

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shiptbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME

TOWER OIL AND TECHNOLOGY CO

EMERGENCY TELEPHONE NO.

312-346-0562

ADDRESS (NUMBER, STREET, CITY AND ZIP CODE)

300, WEST WASHINGTON STREET, CHICAGO, IL. 60606

CHEMICAL NAME AND SYNONYMS

TRADE NAME AND SYNONYMS

SUPER GEAR LUBE GH

CHEMICAL FAMILY

XXXXXXXX

#95 WAY & GEAR LUBE

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE N/A			METALLIC COATINGS N/A		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS OR GASES				%	TLV (Units)
None					

## SECTION III - PHYSICAL DATA

BOILING POINT (°F)	N/A	SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	0.92
VAPOR PRESSURE (mm Hg)	< 0.01	PERCENT VOLATILE BY VOLUME (%)	Negligible
VAPOR DENSITY (AIR = 1)	> 14	EVAPORATION RATE (BA = 1)	< 0.01
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	Liquid. Mild Petroleum Odor.		

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	570°F. C.O.C.	FLAMMABLE LIMITS	LM	UM
EXTINGUISHING MEDIA	Carbon dioxide, Dry chemicals, Foam, Water Spray.			
SPECIAL FIRE FIGHTING PROCEDURES	Use cold water to cool drums and prevent rupture.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None known			

### SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

5mg/m<sup>3</sup> oil mist in air

EFFECTS OF OVEREXPOSURE

N/A

EMERGENCY AND FIRST AID PROCEDURES

Skin contact-wash with warm soapy water.

Eye contact-flush with copious quantities of water.

Ingestion-consult a physician

### SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal-CO, CO<sub>2</sub>.

HAZARDOUS

POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

X

### SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Contain spill and pump into drums, or soak up in absorbent medium.

Finally flush spill with cold water. If spill enters sewer notify

Authorities.

WASTE DISPOSAL METHOD

Submit to contract service for reclaim or disposal.

Dispose of in accordance with City, State and Federal Regulations.

### SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)

VENTILATION

LOCAL EXHAUST

SPECIAL

MECHANICAL (GENERAL)

OTHER

PROTECTIVE GLOVES

Plastic, Rubber, Neoprene

EYE PROTECTION

Goggles. Face Shield.

OTHER PROTECTIVE EQUIPMENT

Use chemical resistant apron if needed to avoid prolonged skin contact.

### SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Do not handle or store near heat, sparks, flame or strong oxidants. Keep containers closed when not in use.

OTHER PRECAUTIONS

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

FORM APPROVED  
OMB NO. 45-R13257

**MATERIAL SAFETY DATA SHEET**

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

**SECTION I**

MANUFACTURER'S NAME

TOWER OIL AND TECHNOLOGY COMPANY

EMERGENCY TELEPHONE NO.

312-346-0562

ADDRESS (NUMBER, STREET, CITY, AND ZIP CODE)

300, WEST WASHINGTON STREET, CHICAGO, IL. 60606.

CHEMICAL NAME AND SYNONYMS

TRADE NAME AND SYNONYMS DUROL E

CHEMICAL FAMILY

FORMULA

DUROL 20

**SECTION II - HAZARDOUS INGREDIENTS**

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE N/A			METALLIC COATINGS N/A		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
None					

**SECTION III - PHYSICAL DATA**

BOILING POINT (°F)	N/A	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	0.59
VAPOR PRESSURE (MM HG.)	<0.01	PERCENT. VOLATILE BY VOLUME (%)	Negligible
VAPOR DENSITY (AIR=1)	> 13	EVAPORATION RATE (BA = 1)	<0.01
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR Clear liquid. A.S.T.M. Color=3. Mild Petroleum Odor.			

**SECTION IV - FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT (METHOD USED)	430°F. C.O.C.	FLAMMABLE LIMITS	Lo	Hi
EXTINGUISHING MEDIA	Carbon Dioxide, Dry chemicals, Foam, Water Spray.			
SPECIAL FIRE FIGHTING PROCEDURES	Use cold water to cool drums and prevent rupture.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None known			

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	5mg/m <sup>3</sup> oil mist in air
EFFECTS OF OVEREXPOSURE	N/A
EMERGENCY AND FIRST AID PROCEDURES	
Skin contact-wash with warm soapy water.	
Eye contact-flush with copious quantities of water.	
Ingestion-consult a physician.	

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (MATERIALS TO AVOID)		Strong oxidizing agents.	
HAZARDOUS DECOMPOSITION PRODUCTS		Thermal-CO, CO <sub>2</sub> .	
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
Contain spill and pump into drums, or soak up in absorbent medium.	
Finally flush spill with cold water. If spill enters sewer notify Authorities.	
WASTE DISPOSAL METHOD	
Submit to contract service for reclaim or disposal.	
Dispose of in accordance with City, State and Federal Regulations.	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (SPECIFY TYPE)		
VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (GENERAL)	OTHER
PROTECTIVE GLOVES	Rubber, Plastic, Neoprene.	EYE PROTECTION
Goggles, Face Shield.		OTHER PROTECTIVE EQUIPMENT
Use chemical resistant apron if needed to avoid prolonged skin contact.		

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants.	
OTHER PRECAUTIONS	

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: GREZALL SOG

CHEMICAL NAME: N/A

CHEMICAL FAMILY: POLYBUTENE

FORMULA: N/A

* N.F.P.A.
FIRE: 1
HEALTH: 2
REACTIVITY: 0

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: Melts @ 700F

VISCOSITY: 3000-3500 S.U.S. @ 210F

VAPOR PRESSURE (mm Hg): N/A

VAPOR DENSITY (AIR = 1): N/A

SOLUBILITY IN WATER: Insoluble

EVAPORATION RATE: (\_\_\_ = 1) N/A

SPECIFIC GRAVITY (WATER = 1): 0.95

PERCENT VOLATILE BY VOLUME: 10%

APPEARANCE AND ODOR: Black semi-solid. Chlorine odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
1,1,1-trichlorethane	10%	350ppm	ND	71-55-6

### **III. FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT:** 700F C.O.C.

**FLAMMABLE LIMITS-**      **LOWER:** ND                      **UPPER:** ND

**EXTINGUISHING MEDIA:**

Water fog, carbon dioxide, dry chemical, foam, earth/sand

**SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to cool containers and prevent rupture. Water may cause frothing.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None known

### **IV. REACTIVITY DATA**

**STABILITY:** Stable

**CONDITIONS TO AVOID:** N/A

**INCOMPATIBILITY:** Strong oxidants

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Carbon monoxide if combustion is not complete.

**HAZARDOUS POLYMERIZATION:** Will not occur

**CONDITIONS TO AVOID:** N/A

### **V. HEALTH HAZARD DATA**

**TLV (THRESHOLD LIMIT VALUE):** 350ppm

Regell SOG

## **EFFECTS OF OVEREXPOSURE-**

### **ACUTE:**

Possible transient skin and eye irritation.

### **CHRONIC:**

Excessive or prolonged skin exposure may cause dermatitis in sensitive individuals.

### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, remove to fresh air. Call MD

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and soap.

## ***VI. SPILL AND LEAK PROCEDURES***

### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spill and transfer to suitable containers or soak up in absorbent medium  
If spill enters sewer, notify Authorities.

### **WASTE DISPOSAL:**

Submit to contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** If above TLV use supplied-air breathing equipment

### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A

*spill SOG*



PROTECTIVE GLOVES: Chemical resistant

EYE PROTECTION: Splash goggles

OTHER PROTECTIVE EQUIPMENT:

Chemical resistant apron if needed to avoid prolonged skin contact.

#### VIII. SPECIAL PRECAUTIONS

##### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants. Avoid temperatures below 15F.

PERSONAL HYGIENE - Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.

\* HAZARD RATINGS:      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

TOWER OIL & TECHNOLOGY CO.

JUNE 22, 1987

encl. 104

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## MATERIAL SAFETY DATA SHEET

**TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606**

PRODUCT NAME: TOWERQUENCH 2

CHEMICAL NAME: N/A

CHEMICAL FAMILY: Petroleum Hydrocarbon

FORMULA: N/A

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: * N.F.P.A.	:
: FIRE: 1	:
: HEALTH: 1	:
: REACTIVITY: 0	:
-----	

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

### I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: Typical 157 S.U.S. @ 100F.

VAPOR PRESSURE (mm Hg): <0.01

VAPOR DENSITY (AIR = 1): >11

SOLUBILITY IN WATER: Negligible

EVAPORATION RATE: (BA = 1) <0.01

SPECIFIC GRAVITY (WATER = 1): 0.89

PERCENT VOLATILE BY VOLUME: Negligible

APPEARANCE AND ODOR: Clear liquid. A.S.T.M. Color=2-. Mild petroleum odor.

### II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

### **III. FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT:** 376F C.O.C.

**FLAMMABLE LIMITS-**      **LOWER:** 0.9%                      **UPPER:** 7.0%

**EXTINGUISHING MEDIA:**

Carbon dioxide, dry chemicals, foam, water spray.

**SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to keep containers cool and prevent rupture. If a spill has not ignited use water spray to disperse vapors. Minimize breathing fumes. Employ supplied-air breathing equipment in confined areas.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None known

### **IV. REACTIVITY DATA**

**STABILITY:** Stable

**CONDITIONS TO AVOID:** N/A

**INCOMPATIBILITY:** Strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Carbon monoxide, sulfur oxides in the case of incomplete combustion.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** N/A

### **V. HEALTH HAZARD DATA**

**TLV (THRESHOLD LIMIT VALUE):** 5mg/m3 as oil mist in air

#### **EFFECTS OF OVEREXPOSURE-**

##### **ACUTE:**

Possible skin and eye irritation. Low order of oral toxicity.

##### **CHRONIC:**

Prolonged or repeated skin contact may tend to remove natural oils resulting in development of dermatitis.

##### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

#### **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air. Call MD

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and soap. Remove contaminated clothing.

#### ***VI. SPILL AND LEAK PROCEDURES***

##### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. If spill enters sewer, notify Authorities.

##### **WASTE DISPOSAL:**

Employ Contract Service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

#### ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** Not normally required.

##### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A

**PROTECTIVE GLOVES:** Chemical resistant.

**EYE PROTECTION:** Splash goggles. Face shield.

**OTHER PROTECTIVE EQUIPMENT:**

Chemical resistant apron if needed to avoid prolonged skin contact.

#### **VIII. SPECIAL PRECAUTIONS**

##### **PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:**

Keep containers closed when not in use. Do not handle or store near heat, flame, sparks or strong oxidants. Avoid exposure to freezing temperatures.

**PERSONAL HYGIENE.** Minimize breathing vapors. Avoid prolonged skin contact. Wash thoroughly before meals & at end of work period. Launder or dry-clean soiled clothing before reuse.

**\* HAZARD RATINGS:**      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

**ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN**

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

**TOWER OIL & TECHNOLOGY CO.**

*January 31, 1988*

# MATERIAL SAFETY DATA SHEET

**TOWER OIL & TECHNOLOGY CO.**  
**205 WEST RANDOLPH STREET**  
**CHICAGO, ILLINOIS 60606**

PRODUCT NAME: EXPRESS GEAR LUBE JK-140

CHEMICAL NAME: N/A

CHEMICAL FAMILY: MINERAL OIL BASE GEAR LUBRICANT

FORMULA: N/A

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: \* N.F.P.A. :  
: FIRE: 1 :  
: HEALTH: 1 :  
: REACTIVITY: 0 :  
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INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: Typical 3500 S.U.S. @ 100F

VAPOR PRESSURE (mm Hg): 5mm

VAPOR DENSITY (AIR = 1): >13

SOLUBILITY IN WATER: Negligible

EVAPORATION RATE: (BA = 1) <0.01

SPECIFIC GRAVITY (WATER = 1): Typical 0.922

PERCENT VOLATILE BY VOLUME: Negligible

APPEARANCE AND ODOR: Dark viscous liquid. Mild petroleum odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

### **III. FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT: Typical = 570F C.O.C.

FLAMMABLE LIMITS- LOWER: 0.9 UPPER: 7.0

#### **EXTINGUISHING MEDIA:**

Foam, dry chemical, water spray, water fog, carbon dioxide.

#### **SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to cool drums and prevent rupture. Avoid breathing products of combustion, which include smoke, carbon monoxide and carbon dioxide. If a spill has not ignited use water spray to disperse vapors.

#### **UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None known.

### **IV. REACTIVITY DATA**

STABILITY: Stable

CONDITIONS TO AVOID: Overheating for extended periods.

INCOMPATIBILITY: Strong oxidizing agents.

#### **HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal - carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: N/A

### **V. HEALTH HAZARD DATA**

TLV (THRESHOLD LIMIT VALUE): 5 mg/m<sup>3</sup> as oil mist in air.

## **EFFECTS OF OVEREXPOSURE-**

### **ACUTE:**

Possible skin and eye irritation. Low order of oral toxicity.

### **CHRONIC:**

Prolonged or repeated skin contact may tend to remove natural oils, resulting in development of dermatitis.

### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air. Call MD

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and soap. Remove contaminated clothing.

## ***VI. SPILL AND LEAK PROCEDURES***

### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. Finally, flush spill area with cold water. If spill enters sewer, notify Authorities.

### **WASTE DISPOSAL:**

Submit to contract service. Disposal procedure should be in accordance with Local, State and Federal Regulations.

## ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** Normally not required.

### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A



PROTECTIVE GLOVES: Chemical resistant

EYE PROTECTION: Splash goggles, face shield

OTHER PROTECTIVE EQUIPMENT:

Chemical resistant apron if needed to avoid prolonged skin contact.

#### VIII. SPECIAL PRECAUTIONS

##### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Do not store near heat, flame, sparks, or strong oxidants.. Avoid temperatures above 120F (50C) for prolonged periods. Persons exposed to oil mists should wear approved breathing devices.

PERSONAL HYGIENE - Avoid prolonged or repeated skin contact. Do not get in eyes. Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.

\* HAZARD RATINGS:      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

TOWER OIL & TECHNOLOGY CO.

JUNE 2, 1987

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: TOWERCUT B-808

CHEMICAL NAME: N/A

CHEMICAL FAMILY: MINERAL OIL BASE METALWORKING FLUID.

FORMULA: N/A

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:	*	N.F.P.A.	:		
:	FIRE:		1	:	
:	HEALTH:		1	:	
:	REACTIVITY:		0	:	
---	---	---	---	---	---

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: Typical 75 S.U.S. @ 100F.

VAPOR PRESSURE (mm Hg): <0.01

VAPOR DENSITY (AIR = 1): >11

SOLUBILITY IN WATER: Negligible

EVAPORATION RATE: (BA = 1)<0.01

SPECIFIC GRAVITY (WATER = 1): 0.9

PERCENT VOLATILE BY VOLUME: Negligible

APPEARANCE AND ODOR: Amber liquid. Mild petroleum odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

## **EFFECTS OF OVEREXPOSURE-**

### **ACUTE:**

Possible skin and eye irritation.

### **CHRONIC:**

Repeated or prolonged skin contact may tend to remove natural oils resulting in development of dermatitis.

### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air & call MD

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and mild soap. Remove contaminated clothing.

## ***VI. SPILL AND LEAK PROCEDURES***

### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. Finally flush area with water. If spill enters sewer notify Authorities.

### **WASTE DISPOSAL:**

Employ contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** Not normally required.

### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: PENETRATING OIL

CHEMICAL NAME: N/A

CHEMICAL FAMILY: PETROLEUM HYDROCARBON

FORMULA: N/A

* N.F.P.A.	:
FIRE: 1	:
HEALTH: 1	:
REACTIVITY: 0	:

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: 300F-600F VISCOSITY: Typical 68 S.U.S. @ 100F.

VAPOR PRESSURE (mm Hg): <0.04 @ 20CVAPOR DENSITY (AIR = 1): 5+

SOLUBILITY IN WATER: Insoluble

EVAPORATION RATE: (BA=1=1) <0.01

SPECIFIC GRAVITY (WATER = 1): 0.90

PERCENT VOLATILE BY VOLUME: Negligible

APPEARANCE AND ODOR: Amber liquid. Mild petroleum odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

## **EFFECTS OF OVEREXPOSURE-**

### **ACUTE:**

Possible skin and transient eye irritation. Low order of oral toxicity.

### **CHRONIC:**

Repeated or prolonged skin contact may tend to remove natural oils, resulting in development of dermatitis.

### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** Excessive exposure may cause irritation to nose and throat.

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and mild soap. Remove contaminated clothing.

## ***VI. SPILL AND LEAK PROCEDURES***

### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. If spill enters sewer, notify Authorities.

### **WASTE DISPOSAL:**

Employ contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** When heated or misted use NIOSH certified respirator if above TLV.

### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A

**MATERIAL SAFETY DATA SHEET**

**TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606**

PRODUCT NAME: SUPER KOOL-KLENE X-20

CHEMICAL NAME: N/A

CHEMICAL FAMILY: PETROLEUM HYDROCARBON

FORMULA: N/A

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: * N.F.P.A.	:
: FIRE:	1 :
: HEALTH:	1 :
: REACTIVITY:	0 :
-----	

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

**I. PHYSICAL DATA**

BOILING POINT: N/A

VISCOSITY: Typical 465 S.U.S. @ 100F.

VAPOR PRESSURE (mm Hg): <0.01mm

VAPOR DENSITY (AIR = 1): >5

SOLUBILITY IN WATER: Negligible

EVAPORATION RATE: (EA = 1) <0.01

SPECIFIC GRAVITY (WATER = 1): 0.92

PERCENT VOLATILE BY VOLUME: Negligible.

APPEARANCE AND ODOR: Clear amber liquid. Mild petroleum odor.

**II. HAZARDOUS INGREDIENTS**

MATERIAL	x	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

### **III. FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT: 400F. C.O.C.

FLAMMABLE LIMITS-      LOWER: 0.9%                      UPPER: 7.0%

#### **EXTINGUISHING MEDIA:**

Carbon dioxide, dry chemicals, foam, water spray.

#### **SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to keep containers cool and prevent rupture. If spill has not ignited use water spray to disperse vapors. Minimize breathing fumes. Employ supplied-air breathing equipment in confined areas.

#### **UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None known.

### **IV. REACTIVITY DATA**

STABILITY: Stable.

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY: Strong oxidizing agents.

#### **HAZARDOUS DECOMPOSITION PRODUCTS:**

Carbon monoxide, sulfur oxides in the case of incomplete combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: N/A

### **V. HEALTH HAZARD DATA**

TLV (THRESHOLD LIMIT VALUE): 5mg/m3 as oil mist in air.

## **EFFECTS OF OVEREXPOSURE-**

### **ACUTE:**

Possible skin and eye irritation.

### **CHRONIC:**

Repeated or prolonged skin contact may tend to remove natural oils resulting in development of dermatitis.

### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air & call MD

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and mild soap. Remove contaminated clothing.

## **VI. SPILL AND LEAK PROCEDURES**

### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. Finally flush area with water. If spill enters sewer notify Authorities.

### **WASTE DISPOSAL:**

Employ contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## **VII. SPECIAL PROTECTION INFORMATION**

**RESPIRATORY PROTECTION:** Not normally required.

### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A



PROTECTIVE GLOVES: Chemical and oil resistant.

EYE PROTECTION: Splash goggles, face shield.

OTHER PROTECTIVE EQUIPMENT:

Use chemical resistant apron if needed to avoid prolonged skin contact.

#### VIII. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Do not handle or store near ignition sources. Avoid exposure to freezing temperatures. Personnel in close vicinity of oil mists above TLV limit should wear approved breathing devices.

PERSONAL HYGIENE. Minimize breathing hot vapors. Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before re-use.

\* HAZARD RATINGS:      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

TOWER OIL & TECHNOLOGY CO.

MARCH 28, 1988

*Tower Oil & Technology Co.*

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

FORM APPROVED  
DWS NO. 44-9-31

## MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

### SECTION I

MANUFACTURER'S NAME

**TOWER OIL AND TECHNOLOGY COMPANY.**

EMERGENCY TELEPHONE NO.

**312-346-0562**

ADDRESS (NUMBER STREET CITY AND ZIP CODE)

**300 WEST WASHINGTON STREET, CHICAGO, IL 60606**

CHEMICAL NAME AND SYNONYMS

TRADE NAME AND SYNONYMS

**GREZALL H**

CHEMICAL FAMILY

**PETROLEUM HYDROCARBONS**

FORMULA

**GREZALL MOH**

### SECTION II - HAZARDOUS INGREDIENTS

PAINTS PRESERVATIVES & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE <b>N/A</b>			METALLIC COATINGS <b>N/A</b>		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
<b>None</b>					

### SECTION III - PHYSICAL DATA

BOILING POINT (°F)	<b>Above</b>	<b>480°P</b>	SPECIFIC GRAVITY (W <sub>20</sub> )	<b>0.96</b>
VAPOR PRESSURE (mm Hg)		<b>N/D</b>	PERCENT VOLATILE BY VOLUME (%)	<b>None</b>
VAPOR DENSITY (AIR=1)		<b>N/D</b>	EVAPORATION RATE (_____ 211)	<b>N/D</b>
SOLUBILITY IN WATER	<b>Negligible</b>			
APPEARANCE AND ODOR	<b>Tan semi-solid. Mineral oil odor.</b>			

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	<b>Above 510°P. C.O.C.</b>	FLAMMABLE LIMITS	<b>N/D</b>	LM	UM
EXTINGUISHING MEDIA	<b>Dry chemical, Carbon Dioxide, Foam, Water Fog, Sand, Earth.</b>				
SPECIAL FIRE FIGHTING PROCEDURES	<b>Firefighters should wear self-contained breathing apparatus.</b>				
UNUSUAL FIRE AND EXPLOSION HAZARDS	<b>Dense smoke.</b>				

### SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

N/A

EFFECTS OF OVEREXPOSURE

May cause skin and eye irritation.

EMERGENCY AND FIRST AID PROCEDURES

Eyes-flush with copious quantities of water and call physician immediately. Skin-wash with warm soapy water. Ingestion-call a physician.

### SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong oxidizing agents:Chronic acid,Hyd.Peroxide.

HAZARDOUS DECOMPOSITION PRODUCTS

CO, CO<sub>2</sub>.

HAZARDOUS

POLYMERIZATION

MAY OCCUR

WILL NOT OCCUR

CONDITIONS TO AVOID

X

### SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Transfer bulk of material into another container. Apply absorbent medium to residue, Sweep up and dispose as solid waste.

WASTE DISPOSAL METHOD

By methods in accordance with Local, State and Federal Regulations.

### SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION SPECIFIC TYPE

None required

VENTILATION

LOCAL EXHAUST

N

N

SPECIAL

MECHANICAL (GENERAL)

N

N

OTHER

PROTECTIVE GLOVES

Rubber, Plastic, Neoprene

EYE PROTECTION

Goggles. Face Shield.

OTHER PROTECTIVE EQUIPMENT

### SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep containers closed. Avoid contact with eyes, skin & clothing. Wash thoroughly after handling.

OTHER PRECAUTIONS

Wash clothing before re-use. Keep away from food products.

# MATERIAL SAFETY DATA SHEET

**TOWER OIL & TECHNOLOGY CO.**  
**205 WEST RANDOLPH STREET**  
**CHICAGO, ILLINOIS 60606**

PRODUCT NAME: HYDROIL AW-4

CHEMICAL NAME: N/A

CHEMICAL FAMILY: Petroleum Hydrocarbon

FORMULA: N/A

* N.F.P.A.	
FIRE:	1
HEALTH:	1
REACTIVITY:	0

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: Typical 230 S.U.S. @ 100F

VAPOR PRESSURE (mm Hg): <0.01mm

VAPOR DENSITY (AIR = 1): >5

SOLUBILITY IN WATER: Negligible

EVAPORATION RATE: (BA = 1) <0.01

SPECIFIC GRAVITY (WATER = 1): 0.91

PERCENT VOLATILE BY VOLUME: Negligible.

APPEARANCE AND ODOR: Clear, pale amber liquid. Mild petroleum odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	*	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

### **III. FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT:** 345F C.O.C.

**FLAMMABLE LIMITS-**      **LOWER:** 0.9%                      **UPPER:** 7.0%

**EXTINGUISHING MEDIA:**

Carbon dioxide, dry chemicals, foam, water spray.

**SPECIAL FIRE FIGHTING PROCEDURES:**

Use cold water to keep containers cool and prevent rupture. If spill has not ignited use water spray to disperse vapors. Minimize breathing fumes. Employ supplied-air breathing equipment in confined areas.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None known.

### **IV. REACTIVITY DATA**

**STABILITY:** Stable.

**CONDITIONS TO AVOID:** N/A

**INCOMPATIBILITY:** Strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Carbon monoxide, sulfur oxides in the case of incomplete combustion.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** N/A

### **V. HEALTH HAZARD DATA**

**TLV (THRESHOLD LIMIT VALUE):** 5mg/m3 as oil mist in air.

440 P. 1

#### **EFFECTS OF OVEREXPOSURE-**

##### **ACUTE:**

Skin and eye irritation. Low order of oral toxicity.

##### **CHRONIC:**

Prolonged or repeated skin contact may tend to remove natural oils resulting in development of dermatitis.

##### **CARCINOGENICITY:**

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

#### **EMERGENCY FIRST AID PROCEDURES-**

**INHALATION:** If overcome by fumes from hot product, move to fresh air. Call MD.

**INGESTION:** Do not induce vomiting. Get medical attention.

**EYE CONTACT:** Flush with water for 15 mins. or until irritation subsides.

**SKIN CONTACT:** Wash with warm water and soap. Remove contaminated clothing.

#### ***VI. SPILL AND LEAK PROCEDURES***

##### **IF MATERIAL IS RELEASED OR SPILLED:**

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. If spill enters sewer notify Authorities.

##### **WASTE DISPOSAL:**

Employ Contract Service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

#### ***VII. SPECIAL PROTECTION INFORMATION***

**RESPIRATORY PROTECTION:** Not normally required.

##### **VENTILATION-**

**LOCAL EXHAUST:** N/A

**SPECIAL:** N/A

**MECHANICAL (GENERAL):** N/A

**OTHER:** N/A

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**PROTECTIVE GLOVES:** Chemical resistant.

**EYE PROTECTION:** Splash goggles. Face shield.

**OTHER PROTECTIVE EQUIPMENT:**

Chemical resistant apron if needed to avoid prolonged skin contact.

#### **VIII. SPECIAL PRECAUTIONS**

##### **PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:**

Keep containers closed when not in use. Do not handle or store near heat, flame, sparks or strong oxidants. Avoid exposure to freezing temperatures.

**PERSONAL HYGIENE** - Minimize breathing vapors. Avoid prolonged skin contact. Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.

**\* HAZARD RATINGS:**      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

**TOWER OIL & TECHNOLOGY CO.**

**JUNE 2, 1987**

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: 611 HI-TEMP LUBE

CHEMICAL NAME: N/A

CHEMICAL FAMILY: MINERAL OIL

FORMULA: N/A

* N.F.P.A.	
FIRE:	1
HEALTH:	1
REACTIVITY:	0

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: Typical 500 S.U.S. @ 100F.

VAPOR PRESSURE (mm Hg): <0.0001

VAPOR DENSITY (AIR = 1): 16+

SOLUBILITY IN WATER: Negligible

EVAPORATION RATE: (ETHYL ETHER=1) Slower

SPECIFIC GRAVITY (WATER = 1): 0.9

PERCENT VOLATILE BY VOLUME: Nil.

APPEARANCE AND ODOR: Clear, bright liquid. Hydrocarbon odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-



### *III. FIRE AND EXPLOSION HAZARD DATA*

FLASH POINT: Minimum 450F C.O.C.

FLAMMABLE LIMITS- LOWER: ND UPPER: ND

#### EXTINGUISHING MEDIA:

Carbon dioxide, dry chemicals, foam, water spray.

#### SPECIAL FIRE FIGHTING PROCEDURES:

Use cold water to keep containers cool and prevent rupture. If spill has not ignited use water spray to disperse vapors. Minimize breathing fumes. Employ supplied-air breathing equipment in confined areas.

#### UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known.

### *IV. REACTIVITY DATA*

STABILITY: Stable

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY: Strong oxidizing agents.

#### HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal - carbon monoxide, carbon dioxide, sulfur oxides in the case of incomplete combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: N/A

### *V. HEALTH HAZARD DATA*

TLV (THRESHOLD LIMIT VALUE): 5mg/m<sup>3</sup> as oil mist in air.

## EFFECTS OF OVEREXPOSURE-

### ACUTE:

Skin and transient eye irritation. Low order of oral toxicity.

### CHRONIC:

Prolonged or repeated skin contact may tend to remove natural oils resulting in development of dermatitis.

### CARCINOGENICITY:

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## EMERGENCY FIRST AID PROCEDURES-

INHALATION: If overcome by fumes from hot product, move to fresh air. Call MD.

INGESTION: Do not induce vomiting. Get medical attention.

EYE CONTACT: Flush with water for 15 mins. or until irritation subsides.

SKIN CONTACT: Wash with warm water and mild soap. Remove contaminated clothing.

## VI. SPILL AND LEAK PROCEDURES

### IF MATERIAL IS RELEASED OR SPILLED:

Recover spilled fluid and transfer to suitable containers or soak up in absorbent medium. Finally, flush area with cold water. If material enters sewer, notify Authorities.

### WASTE DISPOSAL:

Employ contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not normally required.

### VENTILATION-

LOCAL EXHAUST: To comply with T.L.V.

SPECIAL: N/A

MECHANICAL (GENERAL): N/A

OTHER: N/A

PROTECTIVE GLOVES: Chemical resistant.

EYE PROTECTION: Splash goggles. Face shield.

OTHER PROTECTIVE EQUIPMENT:

Chemical resistant apron if needed to avoid prolonged skin contact.

#### VIII. SPECIAL PRECAUTIONS

##### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Do not handle or store near ignition sources or strong oxidants. Avoid exposure to freezing temperatures.

PERSONAL HYGIENE-Minimize breathing vapors. Avoid prolonged skin contact. Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before re-use.

\* HAZARD RATINGS:      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

TOWER OIL & TECHNOLOGY CO.

SEPTEMBER 15, 1987

# MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.  
205 WEST RANDOLPH STREET  
CHICAGO, ILLINOIS 60606

PRODUCT NAME: GREZALL RL-2

CHEMICAL NAME: NA

CHEMICAL FAMILY: RED LITHIUM COMPLEX GREASE

FORMULA: NA

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: \* N.F.P.A. :  
: FIRE: 1 :  
: HEALTH: 1 :  
: REACTIVITY: 0 :  
-----

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

## I. PHYSICAL DATA

BOILING POINT: Melts @ 500F

VISCOSITY: NA

VAPOR PRESSURE (mm Hg): NA

VAPOR DENSITY (AIR = 1): NA

SOLUBILITY IN WATER: Nil

EVAPORATION RATE: (\_\_\_ = 1) NA

SPECIFIC GRAVITY (WATER = 1): 0.89

PERCENT VOLATILE BY VOLUME: 0%

APPEARANCE AND ODOR: Red, slightly stringy semi-solid grease. Bland odor.

## II. HAZARDOUS INGREDIENTS

MATERIAL	X	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

### *III. FIRE AND EXPLOSION HAZARD DATA*

FLASH POINT: 440F C.O.C.

FLAMMABLE LIMITS-      LOWER: NA      UPPER: NA

#### EXTINGUISHING MEDIA:

Carbon dioxide, dry chemical, foam, water fog, earth or sand

#### SPECIAL FIRE FIGHTING PROCEDURES:

Cool fire-exposed containers with cold water to prevent rupture. Water may cause frothing

#### UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known

### *IV. REACTIVITY DATA*

STABILITY: Stable

CONDITIONS TO AVOID: NA

INCOMPATIBILITY: None known

#### HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal - carbon monoxide, carbon dioxide

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: NA

### *V. HEALTH HAZARD DATA*

TLV (THRESHOLD LIMIT VALUE): ND

## EFFECTS OF OVEREXPOSURE-

### ACUTE:

Possible mild skin and transient eye irritation.

### CHRONIC:

Prolonged or repeated skin contact may tend to remove natural oils, resulting in development of dermatitis.

### CARCINOGENICITY:

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

## EMERGENCY FIRST AID PROCEDURES-

INHALATION: NA

INGESTION: Do not induce vomiting. Give water. Call a physician.

EYE CONTACT: Flush with water for 15 mins. or until irritation subsides. Call MD

SKIN CONTACT: Wash with warm water and mild soap. Remove contaminated clothing.

## VI. SPILL AND LEAK PROCEDURES

### IF MATERIAL IS RELEASED OR SPILLED:

Absorb with sand or other inert material. Sweep or scoop up and remove.

### WASTE DISPOSAL:

Employ contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

## VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not normally required

### VENTILATION-

LOCAL EXHAUST: NA

SPECIAL: NA

MECHANICAL (GENERAL): NA

OTHER: NA

100 100

PROTECTIVE GLOVES: Polyvinyl chloride, neoprene, polyethylene

EYE PROTECTION: Face shield

OTHER PROTECTIVE EQUIPMENT:

Chemical resistant apron if needed to avoid prolonged skin contact.

#### VIII. SPECIAL PRECAUTIONS

##### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Do not handle or store near ignition sources. Avoid getting in eyes or on clothing. Keep away from freezing temperatures.

PERSONAL HYGIENE - Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.

\* HAZARD RATINGS:      4 = EXTREME              3 = HIGH              2 = MODERATE  
                                 1 = SLIGHT              0 = INSIGNIFICANT

ND = NOT DETERMINED    NA = NOT APPLICABLE    < = LESS THAN    > = GREATER THAN

*The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.*

TOWER OIL & TECHNOLOGY CO.

JUNE 22, 1987

well P.P.

# TOOL STEELS & WELDING RODS

09/02/97

MANUFACTURER	DATE	DESCRIPTION
CASTLE METALS	04/01/86	NICKEL BASED ALLOY
CASTLE METALS	04/01/86	BRASS
CASTLE METALS	04/01/86	BRONZE
CASTLE METALS	04/01/86	CARBON STEEL
CASTLE METALS	04/01/86	ALUMINUM ALLOYS
CASTLE METALS	04/01/86	ALLOY STEELS
CASTLE METALS	04/01/86	TITANIUM
CASTLE METALS	04/01/86	COPPER
CERTANIUM ALLOYS	06/23/88	MILD STEEL ALLOY
COLT INDUSTRIES	02/28/86	REX AA
COLT INDUSTRIES	11/18/85	AIRDI 150
COLT INDUSTRIES	11/18/85	CPM REX M4
COLT INDUSTRIES	11/01/85	ALUMINUM
COLT INDUSTRIES	11/01/85	CARBON
COLT INDUSTRIES	11/01/85	COBALT
COLT INDUSTRIES	11/01/85	COLOMBIUM
COLT INDUSTRIES	11/01/85	COPPER
COLT INDUSTRIES	11/01/85	IRON
COLT INDUSTRIES	11/01/85	MANGANEZE
COLT INDUSTRIES	11/01/85	MOLYBDENUM
COLT INDUSTRIES	11/01/85	NICKEL
COLT INDUSTRIES	11/01/85	SELENIUM
COLT INDUSTRIES	11/01/85	SILICON
COLT INDUSTRIES	11/01/85	TITANIUM
COLT INDUSTRIES	11/01/85	TUNGSTEN
COLT INDUSTRIES	11/01/85	VANADIUM
ENGELHARD CORP.	07/01/86	METALLIC WIRE
FANSTEEL VR/WESSON	05/01/89	CEMENTED TUNGSTEN
FANSTEEL VR/WESSON	11/22/85	CAST COBALT ALLOY
FANSTEEL VR/WESSON	11/05/85	CEMENTED CARBIDE
McCAY		ASST. WELDING RODS
THERMACOTE WELCO	11/25/84	WELCO 15-15EC



PREPARED BY DISTRIBUTOR:

**Castle Metals®**

A. M. CASTLE & CO.  
3400 N. Wolf Road  
Franklin Park, IL 60131

# MATERIAL SAFETY DATA SHEET

ISSUE DATE

November 25, 1985

REVISED

April 1, 1986

INFORMATION AND EMERGENCY NUMBER:

(312) 455-7111 (8am - 5pm Mon-Fri)

(312) 455-8986 (After Hour Emergency)

**SECTION 1 - PRODUCT IDENTIFICATION**

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Nickel Based Alloy Steel

COMMON NAME / GRADE

Nickel 2XX, Monel Alloy 4XX, Inconel Alloy 6XX & 7XX  
Incoloy Alloy 8XX

**SECTION 2 - HAZARDOUS INGREDIENTS**

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

## Base and Alloying Elements

Ingredients	CAS #	PEL	TLV(2)	Ingredients	CAS #	PEL	TLV(2)
Aluminum (Al)	7429-90-5	N.E.	10	Nickel (Ni)	7440-02-0	1	1
Chromium (Cr)	7440-47-3	.5	.5	Niobium (Nb)	7440-03-1	5	5 (Tantalum)
Cobalt (Co)	7440-48-4	.1	.1 (Dust & Fume)	Silicon (Si)	7440-21-3	15	10 (Total Dust)
Copper (Cu)	7440-50-8	1	1 (Dust & Mist)	Tantalum (Ta)	7440-25-7	5	5
Iron (Fe)	7439-89-6	10	5 (As Iron Oxide)	Titanium (Ti)	7440-32-6	15	10 (Total Dust)
Manganese (Mn)	7439-96-5	5	5 (As Dust-Ceiling)	Tungsten (W)	7440-37-7	N.E.	5
Molybdenum (Mo)	7439-98-7	15	10 (Insoluble Comp.)	Yttrium (Y)	7440-65-5	1	1

## % Alloying Elements (1)

UNS Numbers	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Si	Ta	Ti	W	Y
N02200 Series (Commercially Pure Ni Alloy)		<2				<5		95- 99				<5	<5	
N04400 - N05500 Series (Ni-Cu Alloy)	<5	<1		27- 68	<1	<5		31- 67		<1	<2			
N06600 - N07700 Series (Ni-Cr Alloy)	<5	15- 48	0- 13		1-40	<5	2-10	39- 80	<5		<2	<3	<5	<1
N08800 - N09900 Series (Ni-Fe-Cr Alloy)	<5	.1- 30	0- 15	<2	30- 84	<1	<5	.1- 42	<5			<3		<1

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE

**SECTION 3 - PHYSICAL DATA**

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Gray-Black, Odorless

MELTING POINT (BASE METAL)

&gt;2300 F

SPECIFIC GRAVITY

Approximately 7

**SECTION 4 - FIRE AND EXPLOSION**

EXTINGUISHING MEDIA

NA

SPECIAL FIRE FIGHTING PROCEDURES

Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS

NA

**SECTION 5 - REACTIVITY DATA**

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts with strong acids to produce hydrogen gas.

CONDITIONS TO AVOID

NA

HAZARDOUS DECOMPOSITION PRODUCTS

Metallic dust or fumes may be produced during welding, burning,  
grinding and possibly machining. Refer to ANSI Z49.1

**SECTION 6 - HEALTH HAZARD DATA**

E. STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

**MAJOR EXPOSURE HAZARD:**

☒ INHALATION      ☐ SKIN CONTACT      ☐ SKIN ABSORPTION      ☐ EYE CONTACT      ☐ INGESTION

**EFFECTS OF OVEREXPOSURE**

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ☐ NO: This product's ingredients are not found in the lists below.

☒ YES: ☐ Federal OSHA      ☒ NTP      ☐ IARC

**EMERGENCY AND FIRST AID PROCEDURES**

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

**SECTION 7 - SPILL OR LEAK PROCEDURES****SPILL OR LEAK PROCEDURES**

NA

**WASTE DISPOSAL METHODS**

According to local, state and federal regulations.

**SECTION 8 - SPECIAL PROTECTION****RESPIRATORY**

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

**VENTILATION**

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

**EYE PROTECTION AND PROTECTIVE CLOTHING**

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

**SECTION 9 - SPECIAL PRECAUTIONS**

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Data sheets of individual manufacturers may be obtained by contacting A. M. Castle & Co., 3400 N. Wolf Road, Franklin Park, IL 60131 Attn: Corp. Safety Mgr

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# MATERIAL SAFETY DATA SHEET

ISSUE DATE

November 25, 1985

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April 1, 1986

INFORMATION AND EMERGENCY NUMBER:

(312) 455-7111 (8am - 5pm Mon-Fri)

(312) 455-8986 (After Hour Emergency)

**SECTION 1 - PRODUCT IDENTIFICATION**

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Brass

COMMON NAME / GRADE

Half Hard, Soft, Shim, HR Naval, Muntz  
Free Cutting Leaded**SECTION 2 - HAZARDOUS INGREDIENTS**

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS  
AND METALLIC COATINGS

CAS #

WT % (1)

OSHA PEL

ACGIH TLV (mg/m<sup>3</sup>) (2)

Base Metal

—Copper (Cu)

7440-50-8

60-70

1

1 (Dust &amp; Mist)

Alloying Elements

—Zinc (Zn)

7440-66-6

30-40

N.E.

5 (As Fume)

—Tin (Sn)

7440-31-5

&lt;1

2

2

Free Cutting Leaded

—Lead (Pb)

7439-92-1

&lt;4

.05

.15 (Dust &amp; Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

**SECTION 3 - PHYSICAL DATA**

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Gold/Yellow Colored, Odorless

MELTING POINT (BASE METAL)

&gt;1600 F

SPECIFIC GRAVITY

&gt;8

**SECTION 4 - FIRE AND EXPLOSION**

EXTINGUISHING MEDIA

NA

SPECIAL FIRE FIGHTING PROCEDURES

Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Dust hazard exists under favoring conditions of small practice size. Dispersion in air and strong ignition source may result in an explosion.

**SECTION 5 - REACTIVITY DATA**

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Mercury, Ammonia, Acetylene, Acids

CONDITIONS TO AVOID

Exposure during storage to strong acids, bases or oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Toxic gases, aerosols, and vapors may be released in a fire involving copper alloys if fumes of other compounds or other contacting materials are involved.

PRODUCT Brass

## SECTION 6 - HEALTH HAZARD DATA

STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

### MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

### EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may provide irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of copper, zinc and lead may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Suspected Cancer Agent? ☒ NO: This product's ingredients are not found in the lists below.  
☐ YES: ☐ Federal OSHA ☐ NTP ☐ IARC

### EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

## SECTION 7 - SPILL OR LEAK PROCEDURES

### SPILL OR LEAK PROCEDURES

NA

### WASTE DISPOSAL METHODS

According to local, state and federal regulations.

## SECTION 8 - SPECIAL PROTECTION

**RESPIRATORY** NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

**VENTILATION** Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

### EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

## SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

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# MATERIAL SAFETY DATA SHEET

ISSUE DATE November 25, 1985

REVISED April 1, 1986

INFORMATION AND EMERGENCY NUMBER:  
(312) 455-7111 (8am - 5pm Mon-Fri)  
(312) 455-8986 (After Hour Emergency)**SECTION 1 - PRODUCT IDENTIFICATION**

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Carbon Steel - HR & CR  
Leaded Carbon

COMMON NAME / GRADE

Carbon Steel i.e. A36, 1018, 1010, 1040  
Pressure Vessel Quality  
Leaded Carbon i.e. 10L42**SECTION 2 - HAZARDOUS INGREDIENTS**

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m <sup>3</sup> ) (2)
Base Metal				
Iron	7439-89-6	97-99	10	5 (As Iron Oxide)
Alloying Elements				
Manganese (Mn)	7439-96-5	<2	5	5 (As Dust-Ceiling)
Carbon (C)	7440-44-0	<2	N.E.	N.E.
Aluminum (Al)	7429-90-5	<1	N.E.	10 (Yellow)
Phosphorus (P)	7723-14-0	<1	.1	.1
Sulfur (S)	7704-34-9	<1	13	5 (As SO <sub>2</sub> )
Silicon (Si)	7740-21-3	<1	15	10 (Total Dust)
Vanadium (V)	7440-62-2	<1	.5	.05 (As Respirable Dust)
Columbian (Cb)	7440-03-1	<1	N.E.	N.E.
Bismuth (Bi)	7440-69-9	<1	N.E.	N.E.
Lead Carbon i.e. 10L42				
-Lead (Pb)	7439-92-1	<1	.05	.15 (Dust-Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

**SECTION 3 - PHYSICAL DATA**

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Gray-Black, Odorless

MELTING POINT (BASE METAL)

&gt;2500° F

SPECIFIC GRAVITY

Approximately 7

**SECTION 4 - FIRE AND EXPLOSION**

EXTINGUISHING MEDIA

NA

SPECIAL FIRE FIGHTING PROCEDURES

Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS

NA

**SECTION 5 - REACTIVITY DATA**

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts with strong acids to produce hydrogen gas.

CONDITIONS TO AVOID

NA

HAZARDOUS DECOMPOSITION PRODUCTS

Metallic dust or fumes may be produced during welding,  
burning, grinding and possibly machining. Refer to ANSI Z49.1

**SECTION 6 - HEALTH HAZARD DATA**

TE STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

**MAJOR EXPOSURE HAZARD**

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

**EFFECTS OF OVEREXPOSURE**

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese, and lead may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Suspected Cancer Agent?  X  NO: This product's ingredients are not found in the lists below.  
  YES:   Federal OSHA   NTP   IARC

**EMERGENCY AND FIRST AID PROCEDURES**

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

**SECTION 7 - SPILL OR LEAK PROCEDURES****SPILL OR LEAK PROCEDURES**

NA

**WASTE DISPOSAL METHODS**

According to local, state and federal regulations.

**SECTION 8 - SPECIAL PROTECTION****RESPIRATORY**

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

**VENTILATION**

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

**EYE PROTECTION AND PROTECTIVE CLOTHING**

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

**SECTION 9 - SPECIAL PRECAUTIONS**

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

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## SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Aluminum Alloys  
Aluminum Alloys Containing Lead

COMMON NAME / GRADE

1XXX thru 7XXX Series  
Leaded 2011 & 6262

## SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m <sup>3</sup> ) (2)
Base Metal				
Aluminum (Al)	7429-90-5	80-99.7	N.E.	10 (Metal & Oxide)
Alloying Elements				
Copper (Cu)	7440-50-8	<10	1	1 (Dust & Mist)
Magnesium (Mg)	1309-48-4	<10	15	10
Zinc (Zn)	7440-66-6	<10	N.E.	5 (As Fume)
Cobalt (Co)	7440-48-4	<2	.1	.1 (Dust & Fume)
Iron (Fe)	7439-89-6	<2	10	5 (As Iron Oxide)
Manganese (Mn)	7439-96-5	<2	5	5 (As Dust-Ceiling)
Silicon (Si)	7440-21-3	<2	15	10 (Total Dust)
Tin (Sn)	7440-31-5	<2	2	2
Chromium (Cr)	7440-47-3	<.5	.5	.5
Nickel (Ni)	7440-02-0	<.5	1	1
Leaded Alloys 2011 & 6262				
Lead (Pb)	7439-92-1	<1	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

## SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Silver-Metallic, Odorless

MELTING POINT (BASE METAL)

440-1220 F

SPECIFIC GRAVITY

>2

## SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA

Dry Powder (Class D) or Sand

SPECIAL FIRE FIGHTING PROCEDURES

Do not use water or halogen on dust fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive mixtures. Molten may explode on contact with water.

## SECTION 5 - REACTIVITY DATA

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Anhydrous Bromine. Also see NFPA #491M

CONDITIONS TO AVOID

See Special Precautions.

See Fire and Explosion Section.

HAZARDOUS DECOMPOSITION PRODUCTS

See Special Precautions.

See Fire and Explosion Section.

**SECTION 6 - HEALTH HAZARD DATA**

**NOTE:** STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

**MAJOR EXPOSURE HAZARD:**

☒ **INHALATION**      ☒ **SKIN CONTACT**      ☐ **SKIN ABSORPTION**      ☐ **EYE CONTACT**      ☒ **INGESTION**

**EFFECTS OF OVEREXPOSURE**

Aluminum dust should be treated as a nuisance dust and high exposure may produce irritation of eyes and respiratory system. The potential for overexposure to copper fume may exist when welding, flame cutting, etc. on alloys containing high amounts of copper >2.5%. These alloys include 2XXX, 7XXX and 4145 wrought alloys. Overexposure to copper fume can result in respiratory irritation, nausea and metal fume fever.

Nickel and chromium are contained in certain alloys at levels of 0.1% or more. Chromium and nickel and their compounds are listed in the 3rd Annual Report on Carcinogens, as prepared by the National Toxicology Program (NTP). Their presence in Aluminum alloys, however, should not present a carcinogenic or health concern due to either their low concentrations or the chemical form in which they are present.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Plasma arc cutting or welding aluminum can generate ozone. Overexposures to ozone can result in mucous membrane irritation, as well as pulmonary changes including irritation, congestion and edema.

Suspected Cancer Agent? NO: This product's ingredients are not found in the lists below.

X **YES**:        Federal OSHA      X **NTP**             IARC

**EMERGENCY AND FIRST AID PROCEDURES**

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

**SECTION 7 - SPILL OR LEAK PROCEDURES****SPILL OR LEAK PROCEDURES**

NA

**WASTE DISPOSAL METHODS**

According to local, state and federal regulations.

**SECTION 8 - SPECIAL PROTECTION****RESPIRATORY**

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

**VENTILATION**

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

**EYE PROTECTION AND PROTECTIVE CLOTHING**

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

**SECTION 9 - SPECIAL PRECAUTIONS**

1. Halogen acids and sodium hydroxide in contact with aluminum may generate mixtures of hydrogen.
2. Finely divided aluminum will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates or ammonium nitrate.
3. When remelting aluminum scrap, entrapped moisture or the presence of strong oxidizers such as ammonium nitrate could cause an explosion. This applies to the collection of moisture in saw cavities as well. Moisture must be driven off prior to remelting.
4. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
5. Hard alloy ingots in the 2000 and 7000 series must be stress-relieved to prevent explosion when sawed.
6. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infra-red radiation and ultra-violet radiation.

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PREPARED BY DISTRIBUTOR.

**Castle Metals®**

A. M. CASTLE & CO.  
3400 N. Wolf Road  
Franklin Park, IL 60131

# MATERIAL SAFETY DATA SHEET

ISSUE DATE November 25, 1985

REVISED April 1, 1986

INFORMATION AND EMERGENCY NUMBER:  
(312) 455-7111 (8am - 5pm Mon-Fri)  
(312) 455-8986 (After Hour Emergency)

## SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Alloy Steel - HR & CR  
Alloy Leaded Steel

COMMON NAME / GRADE

Alloy Steel i.e. 4130, 4140, 4340, 8620  
Alloy Leaded i.e. 86L20

## SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m <sup>3</sup> ) (2)
Base Metal				
Iron (Fe)	7439-89-6	86-99	10	5 (As Iron Oxide)
Alloying Elements				
Nickel (Ni)	7440-02-0	<5	1	1
Chromium (Cr)	7440-47-3	<5	.5	.5
Silicon (Si)	7740-21-3	<5	15	10 (Total Dust)
Manganese (Mn)	7439-96-5	<2	5	5 (As Dust-Ceiling)
Carbon (C)	7440-44-0	<2	N.E.	N.E.
Molybdenum (Mo)	7439-98-7	<2	15	10 (Insoluble Compound)
Vanadium (V)	7440-62-2	<2	.5	.05 (Respirable Dust)
Aluminum (Al)	7429-90-5	<2	N.E.	10
Sulfur (S)	7704-34-9	<2	13	5 (As SO <sub>2</sub> )
Phosphorus (P)	7723-14-0	<1	.1	.1 (Yellow)
Bismuth (Bi)	7440-69-9	<1	N.E.	N.E.
Copper (Cu)	7440-50-8	<1	1	1 (Dust & Mist)
Leaded Alloy				
Lead (Pb)	7439-92-1	<1	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

## SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Gray-Black, Odorless

MELTING POINT (BASE METAL)

&gt;2500° F

SPECIFIC GRAVITY

Approximately 7

## SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA

NA

SPECIAL FIRE FIGHTING PROCEDURES

Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS

NA

## SECTION 5 - REACTIVITY DATA

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts with strong acids to provide hydrogen gas.

CONDITIONS TO AVOID

NA

HAZARDOUS DECOMPOSITION PRODUCTS

Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT Alloy

## SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

### MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

### EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese, copper and lead may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferrous oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Inhalation or ingestion of lead particles may result in lead induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possible cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ☐ NO: This product's ingredients are not found in the lists below.

☒ YES: ☐ Federal OSHA ☒ NTP ☐ IARC

### EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

## SECTION 7 - SPILL OR LEAK PROCEDURES

### SPILL OR LEAK PROCEDURES

NA

### WASTE DISPOSAL METHODS

According to local, state and federal regulations.

## SECTION 8 - SPECIAL PROTECTION

### RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

### VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

### EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

## SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

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April 1, 1986

INFORMATION AND EMERGENCY NUMBER:

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**SECTION 1 - PRODUCT IDENTIFICATION**

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Titanium

COMMON NAME / GRADE

Titanium CP, Titanium 6-4, etc.

**SECTION 2 - HAZARDOUS INGREDIENTS**

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m <sup>3</sup> ) (2)
Base Metal				
Titanium	7440-32-6	46-99	15	10 (Total Dust)
Alloying Elements				
Aluminum (Al)	7429-90-5	0-6	N.E.	10
Vanadium (V)	7440-62-2	0-10	.5	.05 (Respirable Dust)
Iron (Fe)	7439-89-6	0-48	10	5 (As Iron Oxide)
Molybdenum (Mo)	7439-98-7	0-6	15	10 (Insoluble Compound)
Tin (Sn)	7440-31-5	0-5	2	2
Zirconium (Zr)	7440-67-2	0-4	10	5
Manganese (Mn)	7439-96-5	0-5	5	5 (As Dust-Ceiling)
Tantalum (Ta)	7440-25-7	<1	5	5
Titanium 6-2-2-2 + 5-2-2-4-4 + 3-8-6-4-4				
Chromium (Cr)	7440-47-3	2-6	.5	.5
Titanium 2.5 + 6-2-1-1				
Copper (Cu)	7440-50-8	2-2.5	1	1 (Dust and Mist)
Titanium .3 - .8				
Nickel (Ni)	7440-02-0	.8	1	1

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

**SECTION 3 - PHYSICAL DATA**

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Gray Metallic, Odorless

MELTING POINT (BASE METAL)

1560-1840° C

SPECIFIC GRAVITY

NA

**SECTION 4 - FIRE AND EXPLOSION**

EXTINGUISHING MEDIA

See Special Precautions

SPECIAL FIRE FIGHTING PROCEDURES

See Special Precautions

UNUSUAL FIRE AND EXPLOSION HAZARDS

This product does not burn, however, grinding or polishing this product in the absence of oxygen, such as under water, can result in a finely divided waste which is ignitable.

**SECTION 5 - REACTIVITY DATA**

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Nitric Acid

CONDITIONS TO AVOID

Corrosion caused by red fuming nitric acid will explode on exposure to friction or heat. See Special Precautions.

HAZARDOUS DECOMPOSITION PRODUCTS

Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

**SECTION 6 - HEALTH HAZARD DATA**

STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

**MAJOR EXPOSURE HAZARD:**

☒ INHALATION      ☐ SKIN CONTACT      ☐ SKIN ABSORPTION      ☐ EYE CONTACT      ☐ INGESTION

**EFFECTS OF OVEREXPOSURE**

The toxicity of titanium dioxide has been found to be relatively inert. Skin contact with titanium dust may cause physical abrasion. Eye contact with pure material has shown particulate irritation.

Aluminum and molybdenum dust/fines and fumes are low health risk by inhalation and should be treated as a nuisance dust.

Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese and copper may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possible cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ☐ NO: This product's ingredients are not found in the lists below.

☒ YES: ☐ Federal OSHA      ☒ NTP      ☐ IARC

**EMERGENCY AND FIRST AID PROCEDURES**

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

**SECTION 7 - SPILL OR LEAK PROCEDURES****SPILL OR LEAK PROCEDURES**

NA

**WASTE DISPOSAL METHODS**

According to local, state and federal regulations.

**SECTION 8 - SPECIAL PROTECTION****RESPIRATORY**

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

**VENTILATION**

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

**EYE PROTECTION AND PROTECTIVE CLOTHING**

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

**SECTION 9 - SPECIAL PRECAUTIONS**

If ignitable waste is generated, special precautions and firefighting procedures should be followed:

- 1) Keep work areas free of the waste.
- 2) Store wet and keep away from heat and open flame - maintain humidity above 50% to prevent an electrostatic build-up.
- 3) No smoking in area.
- 4) Use non-sparking metal equipment.
- 5) Extinguishing media: dry chemical powders, salts or inert gas. Do not use water or liquid: explosion hazard could result.

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## SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME

Various

PRODUCT NAME / TRADE NAME

Copper - CR & HR  
Copper Leadtex Sheet

COMMON NAME / GRADE

Copper Sheet, Oxygen Free, Hard Drawn  
Electrolytic Tough Pitch

## SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m <sup>3</sup> ) (2)
Base Metal				
Copper (Cu)	7440-50-8	>99.9	1	1 (Dust & Mist)
Trace Less Than .1% Phosphorus, Antimony, Selenium Bismuth				
Coating - Leadtex				
Lead (Pb)	7439-92-1	15 lbs./100 sq ft	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE

## SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS)

Solid

APPEARANCE AND ODOR

Copper Metallic, Odorless

MELTING POINT (BASE METAL)

>1800° F

SPECIFIC GRAVITY

>8

## SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA

NA

SPECIAL FIRE FIGHTING PROCEDURES

Products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Dust hazard exists under favoring conditions of small practice size. Dispersion in air and strong ignition source may result in an explosion.

## SECTION 5 - REACTIVITY DATA

STABILITY

Stable

INCOMPATIBILITY (MATERIALS TO AVOID)

Mercury, Ammonia, Acetylene, Acids

CONDITIONS TO AVOID

Exposure during storage to strong acids, bases or oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Toxic gases, aerosols and vapors may be released in a fire involving copper alloys if fumes of other compounds or other contacting materials are involved.

**SECTION 6 - HEALTH HAZARD DATA**

NOTE STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

**MAJOR EXPOSURE HAZARD:**

☒ INHALATION      ☒ SKIN CONTACT      ☐ SKIN ABSORPTION      ☐ EYE CONTACT      ☒ INGESTION

**EFFECTS OF OVEREXPOSURE**

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of copper and lead may cause metal fume fever characterized by a metallic taste in the mouth and irritation of the throat and influenza-like symptoms.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Suspected Cancer Agent? ☒ NO: This product's ingredients are not found in the lists below.  
☐ YES: ☐ Federal OSHA      ☐ NTP      ☐ IARC

**EMERGENCY AND FIRST AID PROCEDURES**

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

**SECTION 7 - SPILL OR LEAK PROCEDURES****SPILL OR LEAK PROCEDURES**

NA

**WASTE DISPOSAL METHODS**

According to local, state and federal regulations.

**SECTION 8 - SPECIAL PROTECTION****RESPIRATORY**

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

**VENTILATION**

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

**EYE PROTECTION AND PROTECTIVE CLOTHING**

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

**SECTION 9 - SPECIAL PRECAUTIONS**

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

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## M A T E R I A L   S A F E T Y   D A T A   S H E E T

\*\*\*\*\*  
 CERTANIUM ALLOYS & RESEARCH CO \* EMERGENCY/INFORMATION TELEPHONE:  
 4500 EUCLID AVENUE \*  
 CLEVELAND, OHIO 44103 \* 216/391-8300  
 \*  
 \* \* \* \* \*  
 \* FORMULA: 701A DATE: 01/30/86  
 \* MSDS EFFECTIVE: 06/23/88 BY: BK  
 \* DATE SUPERCEDED: 10/15/85  
 \*  
 MAIL TO: \*  
 J. L. CLARK MFG \* COF:  
 2300 WISCONSIN AVE \* INVOICE: 361540A  
 DOWNERS GROVE IL 60515 \*  
 \* SDS KEY: 0993244  
 \*

\*\*\*\*\*  
 DEAR CUSTOMER:  
 IN COMPLIANCE WITH THE FEDERAL HAZARD COMMUNICATIONS REGULATIONS (WHMIS AND OSHA 29 CFR 1910.1200) AND IN THE INTEREST OF INFORMED USE OF OUR PRODUCT, WE ARE PROVIDING YOU WITH THIS MATERIAL SAFETY DATA SHEET.  
 THIS MSDS WILL BE UPDATED REGULARLY TO REFLECT THE MOST RECENT INFORMATION IN OUR POSSESSION. PLEASE ENSURE THAT OBSOLETE MSDS SHEETS IN YOUR FILES FOR THIS PART NUMBER ARE DISCARDED.  
 WE THANK YOU FOR YOUR CONTINUED PATRONAGE AND LOOK FORWARD TO PROVIDING YOU WITH ADDITIONAL QUALITY PRODUCTS AND SERVICES.

## \*\*\*\*\* SECTION I - PRODUCT IDENTIFICATION \*\*\*\*\*

PART NUMBER: 12804  
 PRODUCT NAME: CERTANIUM 701 1/8"  
 TRADE NAME/SYNONYMS: MILD STEEL ALLOY  
 CHEMICAL FAMILY: METALS

## \*\*\*\*\* SECTION II - HAZARDOUS INGREDIENTS \*\*\*\*\*

INGREDIENT	CAS #	WT %	TWA	UNITS	LC50,PPM	LD50, MG/KG
*****	*****	*****	*****	*****	*****	*****
MANCANESE	07439-96-5	.1-1	1*	MG/M3	N/A	N/A
RUTILE	01317-80-2	10-30	10	MG/M3	N/A	N/A
KAOLIN	01332-58-7	1-5	10	MG/M3	N/A	N/A
POTASSIUM SILICATE	10006-28-7	1-5	10	MG/M3	N/A	N/A
IRON	07439-89-6	>60	5*	MG/M3	N/A	N/A
MOLYBDENUM	07439-98-7	.1-1	10	MG/M3	N/A	N/A

\*WHEN PRESENT AS FUME

\*\* INGREDIENTS TOTAL WT % ARE BELOW 100% ONLY IF ALL OTHERS UNLISTED ARE NOT CONSIDERED HAZARDOUS BY ANY FEDERAL (OSHA, WHMIS, SARA), ANY STATE OR PROVINCE, OR LOCAL RIGHT-TO-KNOW REGULATIONS.

## \*\*\*\*\* SECTION III - PHYSICAL DATA \*\*\*\*\*

BOILING PT DEG F/C: N/A	SPECIFIC GRAVITY: N/A
VAPOR PRESSURE(MM HG): N/A	%VOLATILE VOLUME: N/A
VAPOR DENSITY(AIR 1): N/A	EVAPORATION RATE: N/A
SOLUBILITY IN WATER: N/A	WATER/OIL DIST COEFF: N/A
APPEARANCE AND ODOR: SOLID ROD	
PHYSICAL STATE: SOLID	
FREEZE PT DEG F/C: N/A	THRESHOLD ODOR, PPM: N/A
OTHER: N/A	PH: N/A

PART: 12304 PRODUCT NAME: CERTANIUM 701 1/8" PAGE 2 OF 3  
 \*\*\*\*\* SECTION IV - FIRE AND EXPLOSION HAZARD DATA \*\*\*\*\*  
 FLAMMABILITY CLASSIFICATION: N/A NFPA RATING: N,/,A  
 COMBUSTION PRODUCTS: SEE SECTION VI-HAZARDOUS DECOMPOSITION PRODUCTS  
 FLASH POINT DEG F/C: N/A LEL%:N/A UEL%:N/A  
 EXTINGUISHING MEDIA: N/A  
 UN/NA/PINH: N/A SPECIAL FIRE FIGHTING PROCEDURES:  
 FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING EQUIPMENT.  
 AUTO IGN. TEMP DEG F/C: N/A UNUSUAL FIRE AND EXPLOSION HAZARDS:  
 N/A

EXPLOSIVE POWER: N/A IMPACT SENSITIVE: NO  
 BURNING RATE: N/A STATIC SENSITIVE: NO

\*\*\*\*\* SECTION V - HEALTH HAZARD DATA \*\*\*\*\*

THRESHOLD LIMIT VALUE: 1 MG/M3 AS MN FUMES PEL: 1 MG/M3  
 ROUTES OF ENTRY: EYE, INHALATION  
 EFFECTS OF OVEREXPOSURE: ACUTE: YES EYE IRRITATION CHRONIC: YES RESPIRATORY  
 OVLREXPOSURE TO WELDING FUMES MAY RESULT IN DIZZINESS, NAUSEA, OR DRYNESS  
 OR IRRITATION OF NOSE, THROAT & EYES. CHRONIC EXCESS WELDING FUMES ABOVE  
 PEL OR TLV MAY BE HAZARDOUS BECAUSE PROLONGED AND REPEATED INHALATION MAY  
 BE HARMFUL TO RESPIRATORY SYSTEM.

LISTED AS A SUSPECTED CARCINOGEN: YES SOME EXPOSURES OR COMPOUNDS OF  
 MN ARE MUTAGENIC & SUSPECTED POTENTIAL CARCINOGENS IN EXPERIMENTAL ANIMALS  
 EMERGENCY AND FIRST AID PROCEDURES:

EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15 MIN. & CALL PHYSICIAN.  
 SKIN: WASH THOROUGHLY WITH PLENTY OF WATER & SOAP. INHALATION: IF AFFECTED,  
 REMOVE TO FRESH AIR, ADMINISTER OXYGEN & CALL PHYSICIAN. INGESTION: SEEK  
 PHYSICIAN IMMEDIATELY, SHOW MSDS OR LABEL, INDUCE VOMITING.

\*\*\*\*\* SECTION VI - REACTIVITY DATA \*\*\*\*\*

STABLE: YES CONDITIONS TO AVOID:

N/A

INCOMPATIBILITY(MATERIALS TO AVOID): NO

HAZARDOUS DECOMPOSITION PRODUCTS:

FUMES AND GASES FROM WELDING AND HIGH TEMPERATURE CUTTING CANNOT BE CLASSIFIED  
 SIMPLY. THE COMPOSITION AND QUANTITY OF BOTH DEPEND ON THE ALLOY BEING WELDED,  
 THE PROCESS, PROCEDURES, AND ELECTRODES USED. THE CONSTITUENTS OF THE FUME MAY  
 BE DIFFERENT FROM THE INGREDIENTS LISTED IN SECTION 2, AND MAY INCLUDE PARTICLES  
 CONTAINING IRON, MANGANESE, SILICON, CHROMIUM, NICKEL, OR OTHER AMORPHOUS SLAGS.  
 THE GASES MAY INCLUDE CARBON MONOXIDE, OZONE, METAL OXIDES, OR METAL FLUORIDES.  
 THE FOLLOWING MG/M3 EXPOSURE LIMITS APPLY TO THOSE FUMES AND GASES WHICH MAY BE  
 FOUND IN THE WELDING OR HIGH TEMPERATURE CUTTING ENVIRONMENT:

SUBSTANCE	PEL	TWA	SUBSTANCE	PEL	TWA
ALUMINUM FUME (AL)	5.0	5.0	MANGANESE FUME (MN)	03.0	1.0
CARBON MONOXIDE (CO)	440.	55.	MOLYBDENUM (MO)	10.0	5.0
CHROMIUM (CR 203)	0.5	0.5	NICKEL (NI)	1.0	0.1
COBALT FUME	0.05	0.05	NITROGEN DIOXIDE (NO2)	10.0	6.0
COPPER FUME (CU)	0.2	0.2	OZONE (O3)	0.6	0.2
FLUORIDES (AS F)	2.5	2.5	WELDING FUMES (NOC)	5.0	5.0
IRON OXIDE FUMES(AS FE)	5.0	5.0			

HAZARDOUS POLYMERIZATION: NO CONDITIONS TO AVOID:

N/A



PART: 12804 PRODUCT NAME: CERTANIUM 701 1/8"

PAGE 3 OF 3

\*\*\*\*\* SECTION VII - SPILL OR LEAK PROCEDURES \*\*\*\*\*

LISTED IN: SARA TITLE III, #302: NO #304, CERCLA: NO #313: YES MN

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

IN CASE OF SPILL: CONTAIN AND PICK-UP WASTE MATERIALS. PUT IN A SEALED APPROVED CONTAINER.

REPORT QUANTITY, LB: 10

KG: 4.54

TPQ, LB: 10,000

REGULATIONS: SARA, CERCLA, PROV/STATE, WHMIS

OTHER: N/A

HAZARD WASTE: NO

NO: N/A

DISPOSAL METHOD:

DISPOSE OF WASTES IN ACCORDANCE WITH FEDERAL, STATE & LOCAL REGULATIONS.

\*\*\*\*\* SECTION VIII - SAFE HANDLING AND PROTECTION INFORMATION \*\*\*\*\*

RESPIRATORY PROTECTION: USE HOOD, RESPIRATOR, OR SUPPLIED AIR MASK.

VENTILATION-LOCAL: REQUIRED, 60 FPM

SPECIAL: WELDERS, ANSI Z49.1

MECHANICAL: REQUIRED

OTHER: N/A

PROTECTIVE GLOVES: WELDERS PROTECTIVE GLOVES EYE PROTECTION: \*(SEE BELOW)

OTHER PROTECTIVE EQUIPMENT:

\*EYE PROTECTION: FACE SHIELD AND COLORED ABSORPTIVE LENS.

WELDERS LEATHER APRON, SLEEVES, AND LEGGINGS.

ESTIMATED LD50, MG/KG: NO

ESTIMATED LC50, PPM: NO

SENSITIZATION: NO

IRRITANT: NO

SYNERGISTIC AGENTS: NO

\*\*\*\*\* SECTION IX - SPECIAL PRECAUTIONS \*\*\*\*\*

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

ARCS, SPARKS, & FLAME MAY BE A SOURCE OF IGNITION OF COMBUSTIBLE MATERIALS.

USE ONLY IN WELL VENTILATED AREAS. DO NOT BREATHE DUSTS. IF VENTILATION IS

INADEQUATE, WEAR APPROVED RESPIRATORY EQUIPMENT. AVOID PROLONGED CONTACT

WITH SKIN. DO NOT TAKE INTERNALLY. WASH THOROUGHLY AFTER USING. KEEP AWAY

FROM FOOD, DRINK AND ANIMAL FEEDS. IN CASE OF ACCIDENT OR ILLNESS, SEEK

PHYSICIAN IMMEDIATELY, SHOW LABEL OR MSDS.

OTHER PRECAUTIONS:

KEEP OUT OF REACH OF CHILDREN. KEEP ONLY IN ORIGINAL LABELED CONTAINERS.

ALWAYS READ AND FOLLOW DIRECTIONS ON PRODUCT LABEL. ADDITIONAL TECHNICAL

DATA SHEETS AND/OR MATERIAL SAFETY DATA SHEETS (MSDS) ARE AVAILABLE UPON

REQUEST. FOR PROFESSIONAL AND INDUSTRIAL USE ONLY.

THE INFORMATION AND RECOMMENDATIONS PROVIDED HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF. HOWEVER, SUCH INFORMATION AND RECOMMENDATIONS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND AND PREMIER INDUSTRIAL CORPORATION DISCLAIMS ANY AND ALL LIABILITY OR LEGAL RESPONSIBILITY FOR USE OR RELIANCE UPON SAME.



# General Material Safety Data Sheet

## 1. PRODUCT IDENTIFICATION

Crucible Specialty Metals Division  
Crucible Materials Corporation  
P.O. Box 977  
Syracuse, New York 13201

**PRODUCT NAME:**

A Supplemental Chemistry Sheet will be issued for each grade shipped to each customer. See Section 2.

**DATE OF PREPARATION:**

November 1, 1985

**TELEPHONE:**

(315) 487-4111

**PREPARED BY:**

Crucible Materials Corporation

**REFERENCES:**

1. "Encyclopedia of Occupational Health and Safety," Vol. 1 and 2, Third Edition. International Labor Office Publications; Geneva, Switzerland. 1983.
2. "Condensed Chemical Dictionary," Tenth Edition. Gessner G. Hawley, Van Nostrand. Reinhold Company. 1981.
3. "Patty's Industrial Hygiene and Toxicology," Third Edition. George D. and Florence E. Clayton. John Wiley and Sons, New York.
4. "Handbook of Industrial Toxicology," E.R. Pleinkett, M.D.; Industrial Health Services. Chemical Publishing Company, Inc., New York. 1976.
5. "Threshold Limit Values for Chemical Substances and Physical Agents," American Conference of Governmental Industrial Hygienists ISBN: 0-936712-39-4. 1984.
6. "Toxic Metals—Pollution Control and Worker Protection," Marshall Sittig. Noyes Data Corporation; Park Ridge, New Jersey. 1976.
7. "Registry of Toxic Effects of Chemical Substances," compiled by NIOSH-Washington, D.C.; U.S. Government Printing Office.
8. "Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes: American Conference of Governmental Industrial Hygienists." 1985.
9. "Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans," Vol. 32. International Agency for Research on Cancer (IARC); Lyons, France. 1985.
10. "Annual Report on Carcinogens," Third Edition. National Toxicology Program, U.S. Department of Health and Human Services, North Carolina. 1985.

## 2. HAZARDOUS INGREDIENTS

No threshold limit values (TLV's) exist for specialty steels. TLV may be applicable to constituent elements.

**COMPONENT ELEMENTS**

**CAS NO.**

**COMPONENT ELEMENTS**

**CAS NO.**

Aluminum (Al)

7429-90-5

Molybdenum (Mo)

7439-98-7

Carbon (C)

7440-44-0

Nickel (Ni)

7440-02-0

Chromium (Cr)

7440-47-3

Selenium (Se)

7782-49-2

Cobalt (Co)

7440-48-4

Silicon (Si)

7440-21-3

Columbium (Cb)

7440-03-1

Titanium (Ti)

7440-32-6

Niobium (Nb-syn with Cb)

7440-03-1

Tungsten (W)

7440-33-7

Copper (Cu)

7440-50-8

Vanadium (V)

7440-62-2

Iron (Fe)

7439-89-6

Manganese (Mn)

7439-96-5

## 5. HEALTH HAZARD DATA (continued)

### B. CONSTITUENT HAZARDS

See Appendix A, Permissible Exposure Limits, for the Threshold Limit Values (TLV's) for each constituent.

#### Effect of Overexposure

##### Acute:

Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever." Though metals such as Copper and Zinc have been most associated with metal fume fever, it is suspected by some authorities that other metallic fumes may produce this condition.

Symptoms consist of chills and fever (very similar to, and easily confused with, flu symptoms), which come on a few hours after exposures. Long term effects of metal fume fever have not been noted.

##### Chronic:

Excessive and repeated inhalation of Chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system—nose, throat and lungs. It is generally believed that the hexavalent forms of Chromium (Cr+6) are responsible for these effects. Similarly, excessive inhalation of Nickel fumes has been associated with respiratory cancer. Both Chromium and Nickel are sensitizers and may cause allergic reactions. Excessive and prolonged inhalation of Manganese (generally over two years of exposure) can cause damage to the central nervous system—specifically, the pathology resembles Parkinson's Disease. Molybdenum is not foreseen as a hazard in the present context. Though Molybdenum has caused toxicity (anemia and poor growth) in farm animals, there is no documented toxicity to humans due to industrial exposures.

See Appendix A for any additional information for each element.

## 6. REACTIVITY DATA

#### STABILITY:

Chemically stable

#### INCOMPATIBILITY:

Reacts with strong acids to generate hydrogen gas

#### HAZARDOUS DECOMPOSITION PRODUCTS:

Metallic Oxides

#### POLYMERIZATION:

Will not occur

#### CONDITIONS TO AVOID:

Avoid generation of airborne dusts and fumes

See Appendix A for additional data (if any) for each element.

## 7. SPILL, LEAK OR DISPOSAL INFORMATION

#### STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL:

N/A

#### SPECIAL PRECAUTIONS:

Use good housekeeping practices to prevent accumulations of dusts and to keep airborne dust concentrations at a minimum.

#### WASTE DISPOSAL METHOD:

Dusts, etc.—follow federal, state and local regulations regarding disposal.

See Appendix A, Handling Procedures, for additional data (if any) for each element.

## 8. SPECIAL PROTECTION INFORMATION

### VENTILATION REQUIREMENTS:

Use general or local exhaust ventilation to keep airborne concentrations of dust and fumes below the TLV. Consult a professional hygienist.

### PERSONAL PROTECTION EQUIPMENT:

Always consult a professional hygienist.

### RESPIRATORY PROTECTION:

If fumes, misting, or dust conditions occur, consult a professional hygienist. Provide NIOSH approved respirators.

### EYE PROTECTION:

Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.

### GLOVES:

Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

### OTHER CLOTHING OR EQUIPMENT:

As required.

## 9. EMERGENCY FIRST AID INFORMATION

If acute overexposure to fumes occurs, remove the victim to fresh air. Then seek medical assistance.

See Section 5, HEALTH HAZARD DATA, Part A, General Comments, for details.

## 10. ADDITIONAL INFORMATION

For additional information, contact:

Quality Assurance Department  
Crucible Specialty Metals Division  
Crucible Materials Corporation  
P.O. Box 977  
Syracuse, New York 13201  
Telephone: (315) 487-4111



## 5. HEALTH HAZARD DATA (continued)

### B. CONSTITUENT HAZARDS

See Appendix A, Permissible Exposure Limits, for the Threshold Limit Values (TLV's) for each constituent.

#### Effect of Overexposure

##### Acute:

Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever." Though metals such as Copper and Zinc have been most associated with metal fume fever, it is suspected by some authorities that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to, and easily confused with, flu symptoms), which come on a few hours after exposures. Long term effects of metal fume fever have not been noted.

See Appendix A for any additional information for each element.

##### Chronic:

Excessive and repeated inhalation of Chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system—nose, throat and lungs. It is generally believed that the hexavalent forms of Chromium (Cr+6) are responsible for these effects. Similarly, excessive inhalation of Nickel fumes has been associated with respiratory cancer. Both Chromium and Nickel are sensitizers and may cause allergic reactions. Excessive and prolonged inhalation of Manganese (generally over two years of exposure) can cause damage to the central nervous system—specifically, the pathology resembles Parkinson's Disease. Molybdenum is not foreseen as a hazard in the present context. Though Molybdenum has caused toxicity (anemia and poor growth) in farm animals, there is no documented toxicity to humans due to industrial exposures.

## 6. REACTIVITY DATA

#### STABILITY:

Chemically stable

#### INCOMPATIBILITY:

Reacts with strong acids to generate hydrogen gas

#### HAZARDOUS DECOMPOSITION PRODUCTS:

Metallic Oxides

#### POLYMERIZATION:

Will not occur

#### CONDITIONS TO AVOID:

Avoid generation of airborne dusts and fumes

See Appendix A for additional data (if any) for each element.

## 7. SPILL, LEAK OR DISPOSAL INFORMATION

#### STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL:

N/A

#### SPECIAL PRECAUTIONS:

Use good housekeeping practices to prevent accumulations of dusts and to keep airborne dust concentrations at a minimum.

#### WASTE DISPOSAL METHOD:

Dusts, etc.—follow federal, state and local regulations regarding disposal.

See Appendix A, Handling Procedures, for additional data (if any) for each element.

## 8. SPECIAL PROTECTION INFORMATION

### VENTILATION REQUIREMENTS:

Use general or local exhaust ventilation to keep airborne concentrations of dust and fumes below the TLV. Consult a professional hygienist.

### PERSONAL PROTECTION EQUIPMENT:

Always consult a professional hygienist.

### RESPIRATORY PROTECTION:

If fumes, misting, or dust conditions occur, consult a professional hygienist. Provide NIOSH approved respirators.

### EYE PROTECTION:

Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.

### GLOVES:

Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

### OTHER CLOTHING OR EQUIPMENT:

As required.

## 9. EMERGENCY FIRST AID INFORMATION

If acute overexposure to fumes occurs, remove the victim to fresh air. Then seek medical assistance.

See Section 5, HEALTH HAZARD DATA, Part A, General Comments, for details.

## 10. ADDITIONAL INFORMATION

For additional information, contact:

Quality Assurance Department  
Crucible Specialty Metals Division  
Crucible Materials Corporation  
P.O. Box 977  
Syracuse, New York 13201  
Telephone: (315) 487-4111





# General Material Safety Data Sheet

## APPENDIX A

**This Appendix** contains specific health related data on the individual component elements which are the ingredients used in Crucible products. Refer to the Supplemental Chemistry Sheet(s) for the maxi-

um level of each element that is present and required to be reported by OSHA Hazard Communication Standard 29 CFR1910.1200.

### ALUMINUM (Al)

CAS NO. 7429-90-5

#### DESCRIPTION (physical)

Silvery ductile non-magnetic metal.

#### PERMISSIBLE EXPOSURE LIMITS

ACGIH-TWA — 10 mg/m<sup>3</sup> Metal oxide

ACGIH-STEL—20 mg/m<sup>3</sup> Metal oxide

ACGIH-TWA — 5 mg/m<sup>3</sup> Welding fumes

#### HEALTH HAZARD

Not generally regarded as industrial health hazard. Potential inhalation hazard; pulmonary fibrosis has been reported. "Aluminosis." Exposures could contribute to "Shaver's Disease."

#### PREVENTIVE MEASURES

Adequate ventilation—mechanical filter respirator. Physical examination of exposed personnel annually, including x-rays of chest.

#### REACTIVITY

Stable metal. Rapidly oxidized by water at 180 C.

#### FIRE AND EXPLOSION DATA

Store away from powerful oxidizers. Powder forms are flammable and explosive. Mixtures in air. Fight fires with special mixtures—dry chemical.

#### HANDLING PROCEDURES

Follow federal, state and local regulations for handling and storage.

**CARBON (C)****CAS NO. 7440-44-0****DESCRIPTION (physical)**

Non-metallic element (black carbon-black odorless solid)

**PERMISSIBLE EXPOSURE LIMITS (for carbon black)**CGIH-TWA — 3.5 mg/m<sup>3</sup> ACGIH-STEL— 7.0 mg/m<sup>3</sup>**CHEMICAL AND PHYSICAL PROPERTIES**

Incompatible with strong oxidizers such as chlorates, bromates and nitrates.

**HEALTH HAZARD**

Mild inhalation hazard—dust. No permanent disability. Moderate eye hazard—irrigate immediately. Long term exposure above limits may result in damage to skin and nails—temporary or permanent damage to lungs and heart.

**PREVENTIVE MEASURES**Good personal hygiene as well as no smoking or eating in work areas. Mechanical ventilation. Dust filter respirator. (Full facepiece SCBA—for exposures to \*PAH levels over 0.1 mg/m<sup>3</sup>—carbon black)**REACTIVITY**

Stable except for powder form. May form carbon monoxide gas—highly toxic.

**FIRE AND EXPLOSION DATA**

Dust flammable.

**HANDLING PROCEDURES**

Keep in leakproof containers away from heat or flame and oxidizers—carbon black (content—\*PAH above 0.1% should be labeled "Suspect Carcinogen").

**CHROMIUM (Cr)****CAS NO. 7440-47-3****DESCRIPTION (physical)**

Hard, brittle, lustrous, steel-grey metal which is very resistant to corrosion.

**PERMISSIBLE EXPOSURE LIMITS**SHA-TWA — 1 mg/m<sup>3</sup>ACGIH-TWA—0.05 mg/m<sup>3</sup> Water insoluble compoundsACGIH-TWA—0.5 mg/m<sup>3</sup> Metal, salts and compoundsACGIH-TWA—0.05 mg/m<sup>3</sup> Water soluble compoundsIDLH — 500 mg/m<sup>3</sup>

NOTE: Above substance recognized as human carcinogen, classified A1A. (A1A are those carcinogens to which a TLV has been assigned.)

**CHEMICAL AND PHYSICAL PROPERTIES**

Properties vary according to specific compound. Soluble in acids (except nitric) and strong alkalis. Above substance incompatible with water in soluble form and chromous salts.

**HEALTH HAZARD**

Irritant, corrosive, sensitizer. Hexavalent salts are most toxic. Carcinogen factor seems to be mostly related to the manufacture of dichromates from the ore (calcium chromate). Latent pulmonary disease, "chromitis," chemical pneumonitis. Sensitization to Chromium may be permanent.

**PREVENTIVE MEASURES**

Adequate ventilation and regular monitoring of work environment. Mechanical filter respirator, chemical goggles, rubber gloves, aprons, boots. Encourage extremely good personal hygiene.

**REACTIVITY**

Stable metal.

**FIRE AND EXPLOSION DATA**

Dust may be flammable.

**HANDLING PROCEDURES**

Store in sealed containers away from alkalis, carbonates, dilute sulfuric acid and dilute hydrochloric acid.



**7 COBALT (Co)****CAS NO. 7440-48-4****DESCRIPTION (physical)**

X Silvery grey very hard brittle magnetic metal, odorless finely divided particulates.

**PERMISSIBLE EXPOSURE LIMITS**ACGIH-TWA —0.05 mg/m<sup>3</sup>ACGIH-STEL—0.1 mg/m<sup>3</sup>IDLH—20.0 mg/m<sup>3</sup>OSHA-TWA —0.1 mg/m<sup>3</sup>

NOTE: All TLV's for metal dust and fume.

**CHEMICAL AND PHYSICAL PROPERTIES**

Soluble in nitric acid. Corrodes easily in air.

**HEALTH HAZARD**

Inhalation of cobalt fume and absorption of cobalt salts can be extremely hazardous. Processes producing cobalt dust or fume should be monitored closely. Some exposures produce asthma-like disease with cough and shortness of breath. Peculiar form of pneumoconiosis resembling berylliosis has been seen in the *cobalt/tungsten carbide industry*.

**PREVENTIVE MEASURES**

Effective local ventilation should be provided when available. Also airline respirator, barrier creams, protective clothing to minimize skin contact. Avoid dust and fumes. Exclude those individuals with diseases of skin and lungs. Remove those who have become sensitized permanently.

**REACTIVITY**

Stable metal.

**FIRE AND EXPLOSION DATA**

Non-combustible except as powder.

**HANDLING PROCEDURES**

Follow federal, state and local regulations for handling and storage.

**COLUMBIUM (Cb) (NIOBIUM [Nb]—synonym)****CAS NO. 7440-03-1****DESCRIPTION (physical)**

Gray or silvery ductile metal. Does not tarnish or oxidize at room temperature.

**PERMISSIBLE EXPOSURE LIMITS**

Maximum allowable concentrations in air—same as Tantalum.

ACGIH-STEL—10 mg/m<sup>3</sup>**HEALTH HAZARD**

Moderate inhalation hazard, slight toxic reaction. No cases of occupational disease are known to date.

**PREVENTIVE MEASURES**

General ventilation to keep dust/fume exposures to a minimum.

**REACTIVITY**

Stable metal. Will oxidize in air above 200 C.

**HANDLING PROCEDURES**

Follow federal, state and local regulations for handling and storage.

**COPPER (Cu)**

CAS NO. 7440-50-8

**DESCRIPTION (physical)**

A reddish metal which takes a brilliant polish, odorless solids.

**PERMISSIBLE EXPOSURE LIMITS**

ACGIH-TWA — 0.2 mg/m<sup>3</sup> Fumes

OSHA-TWA—0.1 mg/m<sup>3</sup> Fumes

ACGIH-TWA — 1.0 mg/m<sup>3</sup> Dust and Mists

OSHA-TWA—1.0 mg/m<sup>3</sup> Dust and Mists

ACGIH-STEL—2.0 mg/m<sup>3</sup>

**CHEMICAL AND PHYSICAL PROPERTIES**

Incompatible with acetylene gas, Magnesium metal. Dissolves readily in nitric and hot concentrated sulfuric acid.

**HEALTH HAZARD**

Essentially non-toxic in elemental form. Irritant, inhalation hazard (emphasize good personal hygiene to prevent dermatitis). Increased risk if Wilson's Disease is present. Inhalation of copper oxide fumes may cause metal fume fever. Onset could be delayed for hours. May irritate eyes and skin. Copper fragments in cornea could cause cataracts.

**PREVENTIVE MEASURES**

Good personal hygiene. Adequate ventilation and mechanical filter respirator, if necessary.

**REACTIVITY**

Stable metal. Will form oxide at elevated temperature or in moist air.

**FIRE AND EXPLOSION DATA**

Flammable in finely divided form.

**HANDLING PROCEDURES**

Follow federal, state and local regulations for handling and storage.

**IRON (Fe)**

CAS NO. 7439-89-6

**DESCRIPTION (physical)**

Silver white malleable metal.

**PERMISSIBLE EXPOSURE LIMITS**

ACGIH-TWA — 5 mg/m<sup>3</sup> For Iron Oxide Fume

OSHA-TWA—10 mg/m<sup>3</sup> For Iron Oxide Fume

ACGIH-STEL—10 mg/m<sup>3</sup> For Iron Oxide Fume

**HEALTH HAZARD**

Mild conjunctivitis, chronic bronchitis, "metal fume fever"—after 5 to 10 years exposure to iron oxide. X-rays may reveal "iron oxide lung" or "welder's siderosis." (Onset may be delayed up to 12 hours. Symptoms could last up to 48 hours.) No permanent disability reported from exposure.

**PREVENTIVE MEASURES**

Adequate ventilation, mechanical filter respirator. Preclude from exposure individuals with pulmonary disease. Physical examination of exposed personnel annually including x-ray.

**REACTIVITY**

Stable at room temperatures. Forms oxides and releases hydrogen at elevated temperatures and in moist air. Dissolves in non-oxidizing acids (sulfuric and hydrochloric) and in cold dilute nitric acid.

**FIRE AND EXPLOSION DATA**

Dust and fine particles suspended in air are flammable and are an explosion risk.

**HANDLING PROCEDURES**

Store in cool dry place separate from mineral acids, organic acids, chlorine, fluorine, hydrogen peroxide, nitrogen dioxide, phosphorus, sodium carbide, and sulfuric acid.

NOTE: Iron is a constituent of hemoglobin and is essential to plant and animal life. Used in medicine and dietary supplements. Essentially non-toxic.

**MANGANESE (Mn)**

CAS NO. 7439-96-5

**DESCRIPTION (physical)**

X Brittle silvery metal (compounds in many colors)

**PERMISSIBLE EXPOSURE LIMITS**

IDLH — 10,000 ppm

ACGIH-TWA — 5 mg/m<sup>3</sup> (ceiling) DustACGIH-TWA — 1 mg/m<sup>3</sup> FumeACGIH-STEL—3 mg/m<sup>3</sup> FumeACGIH-TWA — 1 mg/m<sup>3</sup> (manganese tetroxide)ACGIH-STEL—0.3 ppm (0.6 mg/m<sup>3</sup>) SkinOSHA-TWA — 5 mg/m<sup>3</sup> (ceiling) Dust**CHEMICAL AND PHYSICAL PROPERTIES**

Dissolves in dilute mineral acids.

**HEALTH HAZARD**

Manganese salts can be strong irritants and can affect central nervous system and blood forming system. Can cause dermatitis, "metal fume fever," bronchitis and pneumonitis. Some incidence of cancer. Nerve damage can be permanent. Disorder closely resembles Parkinson's Disease.

**PREVENTIVE MEASURES**

Adequate ventilation, wet methods where possible—mechanical filter respirator. Daily bathing at end of work shift necessary. No eating or smoking in work area. Physical examination of exposed personnel every six months, including complete blood count. Preclude from exposure those individuals with neurological and psychological disorders.

**REACTIVITY**

Stable at room temperature. Metal is chemically reactive and forms oxides at elevated temperatures.

**FIRE AND EXPLOSION DATA**

Dust or powders flammable. Use dry chemical to extinguish.

**HANDLING PROCEDURES**

No specific data presently available for handling Manganese and compounds. Sweep up dry material. See Preventive Measures for protective equipment.

NOTE: Manganese is also essential for plant and animal life in controlled amounts.

**MOLYBDENUM (Mo)**

CAS NO. 7439-98-7

**DESCRIPTION (physical)**

Silvery white metal or greyish black powder. Properties vary according to specific compound.

**PERMISSIBLE EXPOSURE LIMITS**ACGIH-TWA — 5.0 mg/m<sup>3</sup> Soluble compoundsACGIH-STEL—10.0 mg/m<sup>3</sup> Soluble compoundsACGIH-TWA — 10.0 mg/m<sup>3</sup> Insoluble compoundsACGIH-STEL—20.0 mg/m<sup>3</sup> Insoluble compoundsOSHA-TWA — 5.0 mg/m<sup>3</sup> Soluble compoundsOSHA-TWA — 15.0 mg/m<sup>3</sup> Insoluble compounds**CHEMICAL AND PHYSICAL PROPERTIES**

Flammable in form of dust or powder. Incompatible with strong oxidizers. Soluble in hot concentrated nitric acids.

**HEALTH HAZARD**

Low toxicity. No known permanent disability from exposure. Mild irritant to lungs and eyes.

**PREVENTIVE MEASURES**

Ventilation and mechanical filter respirator when necessary, to avoid more soluble forms of Molybdenum or of the oxide.

**REACTIVITY**

Stable metal. Oxidizes at elevated temperature (above 1000 F).

**FIRE AND EXPLOSION DATA**

Flammable in form of dust or powder.

**HANDLING PROCEDURES**

Follow federal, state and local regulations for handling and storage.

**NICKEL (Ni)**

CAS NO. 7440-02-0

**DESCRIPTION (physical)**

Silvery white hard malleable and ductile ferromagnetic metallic element, capable of high lustre and resistant to corrosion in many acids, salts/alkalies, fresh/salt water, and wet/dry gas (properties vary upon specific compound).

**PERMISSIBLE EXPOSURE LIMITS**

OSHA-TWA —1 mg/m<sup>3</sup>  
Metal/soluble compounds

ACGIH-TWA —1 mg/m<sup>3</sup>  
Metal/soluble compounds

ACGIH-STEL—0.3 mg/m<sup>3</sup>  
Metal/soluble compounds

**CHEMICAL AND PHYSICAL PROPERTIES**

Incompatible with strong acids (can give off hydrogen gas), sulfur, wood, other combustibles.

**HEALTH HAZARD**

NOTE: Nickel in form of fume, dust, or mist is considered human carcinogen. Classified as A1A with assigned TLV-ACGIH.

Sensitizer—dermatitis, lung cancer, nasal cavities ("Nickel nose"), risk of pneumonitis and allergic asthmatic reaction.

**PREVENTIVE MEASURES**

Adequate ventilation—mechanical filter respirator. Physical examination of exposed personnel annually with special attention to sinuses and including chest x-rays. Also periodic urine analysis for Nickel. Remove workers if they become sensitized. Preclude all workers from exposure if they have history of disease or skin, sinuses and lungs. No eating, smoking, drinking in areas where Nickel containing materials are used or stored.

**REACTIVITY**

Usually stable metal. Can react violently with flourine, ammonium nitrate, hydrazine, performic acid, phosphorus, sulfur, selenium, mixtures of hydrogen, dioxane, titanium and potassium perchlorate, and carbon monoxide.

**FIRE AND EXPLOSION DATA**

Flammable as dust.

**HANDLING PROCEDURES**

Store in tightly closed containers, away from acids and oxidizers. Nickel powder should be mixed with 70% water for transporting (See Preventive Measures for protective equipment when handling).

**SELENIUM (Se)**

CAS NO. 7782-49-2

**DESCRIPTION (physical)**

Amorphous red powder, becoming black on standing and crystalline on heating.

**PERMISSIBLE EXPOSURE LIMITS**

ACGIH-TWA—0.2 mg/m<sup>3</sup> (Selenium compounds)

**CHEMICAL AND PHYSICAL PROPERTIES**

Soluble in concentrated nitric acid.

**HEALTH HAZARD**

Danger: Sudden inhalation of large quantities of selenium fume may produce instant pulmonary edema. Irritant, sensitizer. Can interfere with enzyme systems (from overexposure). Can also cause dizziness, headache and anemia. Can burn skin and cause eczema, urticaria, yellow discoloration. Red staining of nails, teeth and hair. Pulmonary response to overexposure—"garlic breath," bronchitis, pneumonitis, bronchial asthma. Pulmonary edema as a delayed effect. Nausea, vomiting, abdominal pain, diarrhea, hepatomegaly. Chronic skin exposure to light dust can result in dermatitis.

**PREVENTIVE MEASURES**

TREAT AS AN EMERGENCY! Irrigate eyes with water. Wash contaminated parts of body. Treat skin burns immediately. Remove person to oxygen. See physician. Adequate ventilation—chemical goggles, mechanical filter respirator, rubber or plastic gloves (must be changed frequently), cotton overalls. Special locker and shower facilities available. No eating or smoking in work area. Physical examination of exposed personnel every six months including urine and liver tests. Preclude from exposure those individuals with diseases of skin, lungs, liver, kidney and gastrointestinal tract.

**REACTIVITY**

Selenium compounds are extremely toxic (salt form). Pure Selenium is basically non-toxic.

**HANDLING PROCEDURES**

Commercial elemental Selenium—relatively inert and may be handled without special precaution.

**✧ SILICON (Si)****CAS NO. 7440-21-3****DESCRIPTION (physical)**

✧ Blackish grey shining metallic mass or dark brown amorphous powder.

**PERMISSIBLE EXPOSURE LIMITS**ACGIH-TWA — 5.0 mg/m<sup>3</sup> For respirable particulatesACGIH-STEL— 20.0 mg/m<sup>3</sup> For respirable particulates

Considered nuisance particulate by ACGIH.

**CHEMICAL AND PHYSICAL PROPERTIES**

Considered flammable in powder form.

**HEALTH HAZARD**

Inhalation hazard in form of silicon dioxide (amorphous). Disability could become permanent.

**PREVENTIVE MEASURES**

Adequate ventilation, mechanical filter respirator when necessary. Wet processed where possible. Physical examination of exposed personnel annually, including chest x-ray. Preclude from exposure those individuals with pulmonary diseases.

**REACTIVITY**

Stable metal. Oxidizes at elevated temperature.

**FIRE AND EXPLOSION DATA**

Flammable as dust.

**HANDLING PROCEDURES**

Follow federal, state and local regulations for handling and storage.

**TITANIUM (Ti)****CAS NO. 7440-32-6****DESCRIPTION (physical)**

Lustrous white metal, silvery solid or dark gray amorphous powder.

**PERMISSIBLE EXPOSURE LIMITS**

ACGIH-TWA — None available—considered nuisance particulate

ACGIH-STEL— 20 mg/m<sup>3</sup> Titanium Dioxide**CHEMICAL AND PHYSICAL PROPERTIES**

Inert to nitric acid but attacked by concentrated sulfuric and hydrochloric acid. Titanium powder is chemically active and flammable at room temperature.

**HEALTH HAZARD**

Low toxicity. Slight lung fibrosis, chronic bronchitis possible with exposure to titanium dioxide dust or fumes.

**PREVENTIVE MEASURES**

Adequate ventilation—mechanical filter respirator if necessary. Medical examinations of workers at least once a year.

**REACTIVITY**

Stable metal except in powder form, which is highly flammable.

**FIRE AND EXPLOSION DATA**Flammable—dangerous fire and explosion risk in powder form at room temperature. Will ignite at 1200C and will burn in atmosphere of nitrogen. Do not use water or carbon dioxide (CO<sub>2</sub>) to extinguish fire. Not combustible in titanium dioxide form.**HANDLING PROCEDURES**

Store in tightly closed containers in cool area.

**TUNGSTEN (W)****CAS NO. 7440-33-7****DESCRIPTION (physical)**

Hard grey brittle solid. A steel-grey to tin-white metal.

**PERMISSIBLE EXPOSURE LIMITS**ACGIH-TWA — 5 mg/m<sup>3</sup> Insoluble compoundsACGIH-TWA — 1 mg/m<sup>3</sup> Soluble compoundsACGIH-STEL— 10 mg/m<sup>3</sup> Insoluble compoundsACGIH-STEL— 3 mg/m<sup>3</sup> Soluble compounds**HEALTH HAZARD**

Essentially of low toxicity. (Industrial exposure—related to substances associated with tungsten, not tungsten itself.) "Hard metal lung disease" hazard in form of tungsten carbide—cutting tool. Permanent pulmonary changes can occur if over-exposed.

**PREVENTIVE MEASURES**

Adequate ventilation—mechanical filter respirator when necessary. Preclude from exposure those with pulmonary disease. Annual examination to include chest x-rays (re: tungsten carbide—hard metal lung).

**REACTIVITY**

Metal oxidizes in air (at 400 C). Powder is highly reactive.

**FIRE AND EXPLOSION DATA**

Finely divided form. Highly flammable and may ignite spontaneously.

**HANDLING PROCEDURES**

Follow federal, state and local regulations for handling and storage.

**VANADIUM (V)****CAS NO. 7440-62-2****DESCRIPTION (physical)**

Silvery ductile white solid.

**PERMISSIBLE EXPOSURE LIMITS**

ACGIH-TWA—0.05 mg/m<sup>3</sup> respirable dust and fume  
(for vanadium pentoxide)

NIOSH—0.05 mg/m<sup>3</sup>— 15 minute ceiling limit

See Health Hazard and Reactivity

**HEALTH HAZARD**

Highly toxic in form of pentoxide. Chronic exposures associated with incidences of common respiratory diseases, cardiovascular diseases and certain cancers. Vanadium is a sensitizer.

**PREVENTIVE MEASURES**

Adequate ventilation—chemical goggles, airline respirator, rubber gloves. Encourage strict personal hygiene. Personnel exposed to toxic forms should have x-ray of chest every year and physical examination every six months. Preclude from exposure to toxic form those personnel with pulmonary disease.

**REACTIVITY**

Stable, non-toxic as a metal. Oxides, particularly pentoxide, are highly toxic. Metavanadate, vanadium salts highly toxic.

**HANDLING PROCEDURES**

Should be stored in cool, dry location. See Preventive Measures for protective equipment when handling form of vanadium pentoxide and metavanadate.



## 2. HAZARDOUS INGREDIENTS (continued)

A Supplemental Chemistry Sheet will be sent covering each grade or type of steel purchased. It will have the maximum level of each element that is present and required to be reported by OSHA Hazard Communication Standard 29 CFR 1910.1200.

See Appendix A for the Permissible Exposure Limits as determined by OSHA, ACGIH, and/or IDLH for each component.

## 3. PHYSICAL DATA

<b>BOILING POINT:</b> 686-5660 C	<b>MELTING POINT:</b> 217-3410 C	<b>SPECIFIC GRAVITY:</b> 1.8-19.3
<b>VAPOR PRESSURE:</b> N/A	<b>VAPOR DENSITY:</b> N/A	<b>SOLUBILITY IN WATER:</b> Insoluble except Manganese
<b>EVAPORATION:</b> N/A	<b>PERCENTAGE VOLATILE BY VOLUME:</b> N/A	<b>APPEARANCE AND ODOR:</b> Solid, odorless metal

See Appendix A, Chemical and Physical Properties, for additional data (if any) for each element.

## 4. FIRE AND EXPLOSION DATA

<b>FLASH POINT:</b> None	<b>FIRE POINT:</b> None
-----------------------------	----------------------------

The product is a noncombustible metal.

See Appendix A for any applicable Fire and Explosion Data for each element.

## 5. HEALTH HAZARD DATA

### A. GENERAL COMMENTS

We do not consider this product in the form it is sold to constitute a physical hazard or a health hazard. Subsequent operations such as heating

above 1200 F, cutting and/or grinding may cause some of the ingredients to change to a form which could affect exposed workers.

PRIMARY ROUTES OF ENTRY	EMERGENCY FIRST AID
<b>INHALATION:</b>	Remove to fresh air; if condition continues, consult physician.
<b>EYE CONTACT:</b>	Flush well with running water to remove particulate; get medical attention.
<b>SKIN CONTACT:</b>	Brush off excess dirt; wash area well with soap and water.
<b>INGESTION:</b>	Seek medical help if large quantities of material have been ingested (ingestion of significant amounts of metal is unlikely).

Colt Industries



Crucible  
Specialty Metals  
Division  
Box 977  
Syracuse, New York 13201  
A division of Crucible  
Materials Corporation

# Supplemental Chemistry Sheet

A supplement to the Crucible General  
Material Safety Data Sheet

FEBRUARY 28, 1986

PLANT MGR. / SAFETY DIR.  
J L CLARK MANUFACTURING CO  
2300 WISCONSIN AVE  
DOWNERS GROVE IL 60517

RECEIVED  
MAR 6 1986

J. L. CLARK, ATLAS TUBE DIV  
DOWNERS GROVE, ILL.

ACCT. NO.  
370955-01

This Supplemental Chemistry Sheet lists the ingredients for the grade or type of steel you have received from Crucible.

Refer to the General Material Safety Data Sheet sent to your location after November 18, 1985. It will have details of the component elements in our steels, the potential hazards that might arise in processing the material, protection and first aid information, and other relevant data. Together, the General Material Safety Data Sheet and the Supplemental Chemistry Sheet make up the complete Material Safety Data Sheet.

This SCS will have the maximum level of each alloying element that is present and the maximum level of Nickel and Chromium if present as a residual over 0.1%. Levels of 0.1%, 0.5%, and whole percentages will be used for both alloying and residual elements. For example, if the level of Carbon is 1.20%, the SCS will state Carbon <2.0; if Nickel is at a level of 0.15%, the SCS will state Nickel <0.5. Actual chemistry is available upon request by contacting your local Crucible sales district.

This SCS will apply to any subsequent shipment for the same grade or type of material. You will be advised of any major chemistry changes when a subsequent shipment is made.

Questions should be directed to the Quality Assurance Department for Crucible Specialty Metals.  
Telephone: (315) 487-4111.

## Crucible Specialty Metals

*Knobels*

GRADE NAME  
REX AA

AISI NAME  
T1

C	MN	SI	NI	CR	V	W	FE
<1.0	<1.0	<1.0	<1.0	<5.0	<2.0	<19.0	BAL



Colt Industries



Crucible  
Specialty Metals  
Division  
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NOVEMBER 18, 1985

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DOWNERS GROVE IL 60517

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Questions should be directed to the Quality Assurance Department for Crucible Specialty Metals. Telephone: (315) 487-4111.

*Bushings:  
Punch shanks + tips*

## Crucible Specialty Metals

GRADE NAME  
AIRD1 150

SAISI NAME  
D2

C	MN	SI	NI	CR	V	MO	CO	FE
<2.0	<1.0	<1.0	<1.0	<13.0	<2.0	<2.0	<1.0	BAL

Colt Industries



Crucible  
Specialty Metals  
Division  
Box 977  
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Questions should be directed to the Quality Assurance Department for Crucible Specialty Metals. Telephone: (315) 487-4111.

*per spec sheet*

## Crucible Specialty Metals

GRADE NAME  
CPM REX M4

SAE NAME  
M4

C	MN	SI	NI	CR	V	W	MO	FE
<2.0	<1.0	<1.0	<1.0	<5.0	<5.0	<7.0	<6.0	BAL

No. 79  
50

**Material Safety Data Sheet**  
May be used to comply with  
OSHA's Hazard Communication Standard,  
29 CFR 1910.1200. Standard must be  
consulted for specific requirements.

16-94A1, A2

**U.S. Department of Labor**  
Occupational Safety and Health Administration  
(Non-Mandatory Form)  
Form Approved  
OMB No. 1218-0072

**IDENTITY (As Used on Label and List)**  
Ag-Cu-Zn-Cd-Ni Brazing alloy - Silvaloy 50N  
(503)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

**Section I**

Manufacturer's Name Engelhard Corporation	Emergency Telephone Number 617-695-7811
Address (Number, Street, City, State, and ZIP Code) Route 152 Plainville, MA 02762	Telephone Number for Information 617-695-7811
	Date Prepared 7/1/86
	Signature of Preparer (optional)

**Section II — Hazardous Ingredients/Identity Information**

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (app)
Silver - (Ag) CAS #7440-22-4 (2, 4)	0.01 Mg/M <sup>3</sup>	0.1 Mg/M <sup>3</sup>	-	50
Copper - (Cu) " #7440-50-8 (2, 4)	0.1 Mg/M <sup>3</sup>	0.2 Mg/M <sup>3</sup>	-	15.5
Zinc - (Zn) " #7440-66-6 (5)	5 Mg/M <sup>3</sup>	5 Mg/M <sup>3</sup>	-	15.5
Cadmium - (Cd) " #7440-43-9 (1, 2, 3)	0.1 Mg/M <sup>3</sup>	0.05 Mg/M <sup>3</sup>	-	16
Nickel - (Ni) " #7440-02-0 (1, 2, 3)	1 Mg/M <sup>3</sup>	1 Mg/M <sup>3</sup>	-	3

RESOURCE

PREPARED

**Section III — Physical/Chemical Characteristics**

Boiling Point	N.A.	Specific Gravity (H <sub>2</sub> O = 1)	Approx.	4.5-5 T.O./
Vapor Pressure (mm Hg.)	Negligible	Melting Point	Approx.	1200
Vapor Density (AIR = 1)	N.A.	Evaporation Rate (Butyl Acetate = 1)		N.

Solubility in Water  
Insoluble

Appearance and Odor

Metallic wire, rod or strip. No odor.

**Section IV — Fire and Explosion Hazard Data**

Flash Point (Method Used)	N.A.	Flammable Limits	N.A.	LEL	-	UEL
---------------------------	------	------------------	------	-----	---	-----

Extinguishing Media This is a nonflammable material. Use extinguishers which are appropriate for the surrounding fire.

Special Fire Fighting Procedures

None

Unusual Fire and Explosion Hazards Toxic fumes and vapors can be emitted from this metal alloy heated to molten condition in a fire situation.

**Section V — Reactivity Data**

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials ~~not~~ Avoid) N.A.**Hazardous Decomposition or Byproducts**

Zinc or cadmium vapors while brazing.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	Avoid overheating while brazing to minimize zinc or cadmium vaporization.

**Section VI — Health Hazard Data**

Route(s) of Entry:	Inhalation? X	Skin? No	Ingestion? No
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**Health Hazards (Acute and Chronic)**

Excessive inhalation of dust or fumes can produce irritation and inflammation of respiratory tract and lung tissue, causing pulmonary edema, bronchitis, pneumonitis, etc.

Chronic exposure can produce kidney damage and emphysema; acute overexposure can be fatal.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
Ag/Cu/Zn	No	No	Yes
Cd/Ni	Yes	Yes	Yes

**Signs and Symptoms of Exposure**

Ingestion and inhalation will cause vomiting, diarrhea, headache, dizziness, fever, chest pains and breathlessness.

**Medical Conditions**

Generally Aggravated by Exposure Respiratory ailments

**Emergency and First Aid Procedures** Inhalation: Remove victim of excessive fume exposure from the heated alloy to fresh air. Restore and/or support breathing as needed. Have trained person administer oxygen if breathing is different. Keep warm and at rest. Contact physician!

**Section VII — Precautions for Safe Handling and Use****Steps to Be Taken in Case Material is Released or Spilled**

No problems known in collection of alloy (wire, rod or strip forms for example) for use reclaim or scrap.

**Waste Disposal Method** Consider possible reclaim value. Scrap alloy can be disposed of through licensed waste disposal company, in accordance with Federal, State and Local regulation. The safe disposal of collected fume particulate (see Sects. V and VIII) from the exhaust ventilation system must also be considered.

**Precautions to Be Taken in Handling and Storing**

Store carefully in a clean, dry place to prevent contamination.

Keep away from strong oxidizing agents.

**Other Precautions** Provide general and local exhaust ventilation with filter. Maintain air flow of 100 lfm in brazing zone. In confined areas, approved air-supplied or self-contained breathing equipment is required by workers if ventilation is not adequate.

**Section VIII — Control Measures****Respiratory Protection (Specify Type)**

See above

Ventilation	Local Exhaust X	Special Approved air-supplied or self-contained breathing equipment.
	Mechanical (General) X	Other -

**Protective Gloves**  
Not recommended

**Eye Protection**  
Glasses recommended

**Other Protective Clothing or Equipment**

Wear nonflammable protective clothing for torch brazing.

**Work/Hygienic Practices**

N.A.

MATERIAL SAFETY  
DATA SHEET

FANSTEEL VR/WESSON  
203 LISLE ROAD  
LEXINGTON, KENTUCKY 40505  
PHONE (606) 252-1431

Chemical Name: Cemented Tungsten Carbide Product with Cobalt Binder

Trade Name and Synonyms: All Fansteel VR/Wesson Tungsten Carbide Grades

Chemical Family: Refractory Metal Carbide  
Molecular Weight: N/A

PHYSICAL DATA

Appearance and Odor: Dark Gray Metal/No Odor      Specific Gravity: ( $H_2O=1$ ): 11.0 to 15.5  
Boiling Point: NA      Percent Volatile by Volume: 0  
Vapor Pressure (mm Hg): NA      Evaporation Rate: N/A  
Vapor Density (Air=1): NA      How Best Monitored: Air Sample  
Solubility in Water: Insoluble

HAZARDOUS INGREDIENTS

Tungsten carbide contains between 3% and 25% cobalt (Chemical Abstract Service (CAS) Number 7440-48-4) which is subject to the reporting requirements of #313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 C.F.R., Part 372.

	Percent by Weight	OSHA PEL	ACGIH TLV
Tungsten Carbide (limits for Tungsten dust)	62 - 97%*	----	5.0 mg/m <sup>3</sup>
Cobalt	3 - 25%*	0.1 mg/m <sup>3</sup>	0.05mg/m <sup>3</sup>
Tantalum Carbide (limits for Tantalum dust)	0.0-50%*	5.0 mg/m <sup>3</sup>	5.0 mg/m <sup>3</sup>
Chromium Carbide (limits for Chromium (+3) dust)	0.0-1.5%*	1.0 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Chromium (+3)	0.0-1.0%*	1.0 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>

HEALTH HAZARD DATA

Routes of Exposure:

Grinding cemented tungsten carbide product will produce dust of potentially hazardous ingredients which can be inhaled, swallowed, or come in contact with the skin or the eyes.

EFFECTS OF OVEREXPOSURE:

Inhalation-----Dust from grinding can cause irritation of the nose and the throat. It also has the potential for causing transient or permanent respiratory disease, including occupational asthma and interstitial fibrosis (or lung scarring), in certain individuals who are exposed over a period of time. It is reported that cobalt dust is the most probable cause of such respiratory diseases. Symptoms include a productive cough, wheezing, shortness of breath, chest tightness, and weight loss. Interstitial fibrosis can lead to permanent disability or death. Coolant mist from wet grinding may contain dust.

## HEALTH HAZARD DATA CONT.

Skin Contact-----Can cause irritation or an allergic skin rash due to cobalt sensitization.

Eye Contact-----Can cause irritation.

Ingestion-----Certain reports outside the tungsten carbide industry suggest that ingestion of significant amounts of cobalt has the potential for causing blood, heart, and other organ problems.

## EMERGENCY FIRST AID PROCEDURES: Applicable for dusts or mists

Inhalation-----If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.), remove from exposure and seek medical attention.

Skin Contact-----If irritation or rash occurs, thoroughly wash affected area with soap and water, and isolate from exposure. If irritation or rash persists, seek medical attention.

Eye Contact-----If irritation occurs, flush with copious amounts of water. If irritation persists, seek medical attention.

Ingestion-----If substantial quantities are swallowed, dilute with a large amount of water, induce vomiting and seek medical attention.

Carcinogenic Assesment (NTP Annual Report, IARC Monographs, other): None of the components of this material have been identified as known or suspected carcinogens by NTP, IARC, or OSHA.

## FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A Test Method Used: --- Flammable Limits: N/A LEL: --- UEL: ---

Hard Cemented Tungsten Carbide Product is not a fire hazard. Dusts generated in grinding operations may ignite if allowed to accumulate and subjected to an ignition source.

Extinguishing Media: For powder fires, use dry sand, dry dolomite, ABC-type fire extinguisher, or flood the area with water.

Special Fire Fighting Procedures: For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire, fire fighters should use a self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion, and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

REACTIVITY DATA

Stability: Unstable\_\_\_ Stable X Conditions to Avoid: N/A

Incompatibility: Contact of dust with strong oxidizers may cause fire or explosions.

Materials to Avoid: Strong acids

Hazardous Decomposition Products: None

Hazardous Polymerization: May Occur\_\_\_  
Will Not Occur X

Conditions to Avoid: N/A

SPILL OR LEAK PROCEDURES

Steps To Be Taken In Case Material is Released or Spilled: Ventilate area of spill. Clean up, using methods which avoid dust generation such as a vacuum (with appropriate filter to prevent airborne dust levels which exceed PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclamation.

SPECIAL PROTECTION INFORMATION

Respiratory Protection:

Use an appropriate NIOSH approved respirator if airborne dust concentrations exceed the appropriate PEL or TLV. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

Ventilation:

Use local exhaust ventilation which is adequate to limit personal exposure to airborne dust to levels which do not exceed the PEL or TLV. If such equipment is not available use respirators as specified above.

Protective Gloves:

Protective gloves or Barrier cream are recommended when contact with dust or mist is likely. Prior to applying the Barrier cream or use of protective gloves; wash thoroughly.

Eye Protection:

Safety glasses with side shields or goggles are recommended.

Other Protective Equipment:

Before using as a cutting tool, make sure tool is properly seated and safely clamped. Always use machine guards and wear safety glasses and protective clothing to prevent injury in the event of tool breakage.

SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage:

Maintain good housekeeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust.

Other Precautions:

Clean up, using methods which avoid dust generation such as a vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash hands thoroughly after handling, before eating or smoking. Wash exposed skin at the end of work shift. Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming (with appropriate filters) the clothing, rags, or other items.

Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

In Case of Questions, Please Call:

FANSTEEL VR/WESSON  
Division Technical Manager  
606-252-1431

Issue Date: 05-01-89

Supersedes: 11-25-85

Although Fansteel VR/Wesson has attempted to provide current and accurate information herein, Fansteel VR/Wesson makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person.



MATERIAL SAFETY  
DATA SHEET

Fansteel VR/Wesson  
800 Market Street  
Waukegan, IL 60085

Phone: (312)689-5000

Chemical Name: Cast Cobalt Alloy

Trade Name and Synonyms: All Fansteel VR/Wesson Tantung (TM) Grades. *Tad like grinded*

Chemical Family: Cast Cobalt Alloy Molecular Weight: N/A

PHYSICAL DATA

Appearance and Odor: Gray to Silver Metal/ No Odor Specific Gravity (H2O=1): 8.3 to 8.9  
Boiling Point: N/A Percent Volatile by Volume: 0  
Vapor Pressure (mm Hg):N/A Evaporation rate: N/A  
Vapor Density (Air=1): N/A How Best Monitored: Air Sample  
Solubility in Water: Insoluble

HAZARDOUS INGREDIENTS

	Percent by Weight	OSHA PEL	ACGIH TLV
Cobalt	43-50% *	0.1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>
Chromium (+3)	25-32% *	1 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
Tungsten	14-21% *	---	5 mg/m <sup>3</sup>
Manganese	1-3% *	---	5 mg/m <sup>3</sup>

\*Depends on grade specifications

HEALTH HAZARD DATA

Routes of Exposure:  
(TM)

Grinding Tantung cast cobalt alloys will produce dust of potential hazardous ingredients which can be inhaled, swallowed or come in contact with skin or eyes.

Effects of Overexposure:

Inhalation - Dust from grinding can cause irritation of the nose and throat. It also has the potential for causing transient or permanent respiratory disease, including occupational asthma and interstitial fibrosis (or lung scarring), in certain individuals who are exposed over a period of time. It is reported that cobalt dust is the most probable cause of such respiratory diseases. Symptoms include productive cough, wheezing, shortness of breath, chest tightness and weight loss. Interstitial fibrosis can lead to permanent disability or death. Coolant mist from wet grinding may contain dust.

Dusts containing manganese may cause nose bleeds and a higher than normal incidence of upper respiratory infections. Breathing of dusts containing manganese for prolonged periods of time can cause central nervous system disorders.

## =====

## Health Hazard Data Cont.

- =====
- Skin Contact - Can cause irritation or an allergic skin rash due to cobalt or manganese sensitization.
- Eye Contact - Can cause irritation.
- Ingestion - Certain reports outside the casting industry suggest that ingestion of significant amounts of cobalt has the potential for causing blood, heart and other organ problems.

## Emergency and First Aid Procedures: Applicable for dusts or mists.

- Inhalation - If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.), remove from exposure and seek medical attention.
- Skin Contact - If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention.
- Eye Contact - If irritation occurs, flush with copious amounts of water. If irritation persists, seek medical attention.
- Ingestion - If substantial quantities are swallowed, dilute with a large amount of water, induce vomiting and seek medical attention.

---

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, other):

None of the components of this material have been identified as known or suspected carcinogens by NTP, IARC, or OSHA.

## =====

## FIRE AND EXPLOSION HAZARD DATA

=====

Flash Point: N/A Test Method Used: --- Flammable Limits: N/A LEL: ---  
UEL: ---

Solid Cast Cobalt Alloy is not a fire hazard. Dusts generated in grinding operations may ignite if allowed to accumulate and subjected to an ignition source.

Extinguishing Media: For powder fires use dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

Special Fire Fighting Procedures: For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire, fire fighters should use self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

## =====

## REACTIVITY DATA

=====

Stability: Conditions to Avoid: N/A

Unstable: Stable: X

Incompatibility: Materials to Avoid:  
Contact of dust with strong Strong Acids  
oxidizers may cause fire or  
explosions.

Hazardous Decomposition Products: None

Hazardous Polymerization: Conditions to Avoid: N/A  
May Occur:

Will Not Occur: X

## =====

## SPILL OR LEAK PROCEDURES

=====

Steps to be Taken in Case Material is Released or Spilled: Ventilate area of spill. Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclaim.

## =====

## SPECIAL PROTECTION INFORMATION

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Respiratory Protection:  
Use an appropriate NIOSH approved respirator if airborne dust concentrations exceed the appropriate PEL or TLV. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

Ventilation: Use local exhaust ventilation which is adequate to limit personal exposure to respirable airborne dust to levels which do not exceed PEL or TLV. If such equipment is not available use respirators as specified above.

Protective Gloves: Protective gloves or Barrier cream are recommended when contact with dust or mist is likely. Prior to applying the Barrier cream or use of protective gloves, wash thoroughly.

Eye Protection: Safety glasses with side shields or goggles are recommended.

Other Protective Equipment: Before using as a cutting tool, make sure tool is properly seated and safely clamped. Always use machine guards and wear safety glasses and protective clothing to prevent injury in the event of tool breakage.

=====

SPECIAL PRECAUTIONS

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Precautions to be Taken in Handling and Storage: Maintain good house-keeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust.

Other Precautions: Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash hands thoroughly after handling, before eating or smoking. Wash exposed skin at the end of work shift. Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming (with appropriate filters) the clothing, rags, or other items.

Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

=====

In Case of Questions Please Call:

FANSTEEL VR/WESSON  
Division Technical Manager  
(312)689-5000

Issue Date: 11/22/85

Supersedes: N/A

=====

Although Fansteel VR/Wesson has attempted to provide current and accurate information herein, Fansteel VR/Wesson makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person.

MATERIAL SAFETY  
DATA SHEET

Fansteel VR/Wesson  
800 Market Street  
Waukegan, IL 60085

Phone: (312)689-5000

Chemical Name: Cemented Carbide Product with Nickel binder.

*Tool bits  
grinded*

Trade Name and Synonyms: Fansteel VR/Wesson Carbide Grades VR65 and W588.

Chemical Family:  
Refractory Metal Carbide

Molecular Weight: N/A

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PHYSICAL DATA

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Appearance and Odor: Dark Gray Metal/No Odor

Boiling Point: N/A

Specific Gravity (H2O=1): 5.6 to 6.2

Vapor Pressure (mm Hg): N/A

Percent Volatile by Volume: 0

Vapor Density (Air=1): N/A

Evaporation rate: N/A

Solubility in Water: Insoluble

How Best Monitored: Air Sample

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HAZARDOUS INGREDIENTS

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	<u>Percent by Weight</u>	<u>OSHA PEL (Unit)</u>	<u>ACGIH TLV (Unit)</u>
Molybdenum Carbide (limits for Molybdenum dust)	18%	---	10 mg/m <sup>3</sup>
Nickel	12-18% *	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
*Depends on grade specifications			

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HEALTH HAZARD DATA

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Routes of Exposure:

Grinding cemented carbide product will produce dust of potentially hazardous ingredients which can be inhaled, swallowed or come in contact with the skin or eyes.

Effects of Overexposure:

- Inhalation - Dust from grinding can cause irritation of the nose and throat. Nickel is suspected of causing nasal and lung cancer. Symptoms include pain, bleeding, nasal obstruction, vision impairment, weight loss, and voice resonance change. Certain pulmonary conditions may be aggravated by exposure.
- Skin Contact - Can cause an irritation or skin rash due to nickel sensitization. Certain skin conditions, such as dry skin, may be aggravated by exposure.
- Eye Contact - Can cause irritation.
- Ingestion - Current scientific information indicates no adverse effects are likely from ingestion of small amounts of dust generated from these products.

Health Hazard Data Cont.

- Emergency and First Aid Procedures: Applicable for dusts or mists.
- |              |  |
|--------------|--|
| Inhalation   | - If inhalation symptoms develop, remove from exposure and seek medical attention.   |
| Skin Contact | - If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention. |
| Eye Contact  | - If irritation occurs, flush with copious amounts of water. If irritation persists, seek medical attention.   |
| Ingestion    | - If substantial quantities are swallowed, dilute with a large amount of water. Induce vomiting and seek medical attention.  |

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, other):  
Nickel has been identified as a suspected carcinogen by NTP, IARC or OSHA.

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FIRE AND EXPLOSION HAZARD DATA

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Flash Point: N/A Test Method Used: --- Flammable Limits: N/A LEL: ---  
UEL: ---

Hard Cemented Carbide Product is not a fire hazard. Dusts generated in grinding operations may ignite if allowed to accumulate and subjected to an ignition source.

Extinguishing Media: For powder fires use dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

Special Fire Fighting Procedures:

For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire involving this material, fire fighters should use self-contained breathing apparatus.

Unusual Fire and Explosion Hazards:

Dusts may present a fire or explosion hazard under rate favoring conditions of particle size, dispersion and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

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REACTIVITY DATA

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Stability: Conditions to Avoid: N/A

Unstable: Stable: X

Incompatibility: Materials to Avoid:  
Contact of dust with strong Strong Acids  
oxidizers may cause fire or  
explosions.

Hazardous Decomposition Products: None

Hazardous Polymerization: Conditions to Avoid: N/A  
May Occur:

Will Not Occur: X

=====

SPILL OR LEAK PROCEDURES

=====

Steps to be Taken in Case Material is Released or Spilled: Ventilate area of spill. Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclaim.

=====

SPECIAL PROTECTION INFORMATION

=====

Respiratory Protection:  
Use an appropriate NIOSH approved respirator if airborne dust concentrations exceed the appropriate PEL or TLV. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

Ventilation: Use local exhaust ventilation which is adequate to limit personal exposure to airborne dust to levels which do not exceed the PEL or TLV. If such equipment is not available use respirators as specified above.

Protective Gloves: Protective gloves or barrier cream are recommended when contact with dust or mist is likely. Prior to applying the Barrier cream or use of protective gloves, wash thoroughly.

Eye Protection: Safety glasses with side shields or goggles are recommended.

Other Protective Equipment:  
Before using as a cutting tool, make sure tool is properly seated and safely clamped. Always use machine guards and wear safety glasses and protective clothing to prevent injury in the event of tool breakage.

SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage: Maintain good house-keeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust.

Other Precautions: Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash hands thoroughly after handling, before eating or smoking. Wash exposed skin at the end of work shift. Do not shake clothing, rags or other items to removed dust. Dust should be removed by washing or vacuuming (with appropriate filters) the clothing, rags, or other items.

Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

In Case of Questions Please Call:

FANSTEEL VR/WESSION  
Division Technical Manager  
(312)689-5000  
Supersedes: N/A

Although Fansteel VR/Wession has attempted to provide current and accurate information herein, Fansteel VR/Wession makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person.



**Table 1 — McKAY MILD STEEL ELECTRODES**  
To AWS A5.1, Specification for Carbon Steel Covered Arc Welding Electrodes

McKAY GRADE	AWS CLASS	TYPICAL DEPOSIT CHEMISTRY, %				OTHER INGREDIENTS
		Carbon C	Manganese Mn	Silicon Si	Iron Fe	
6010	E6010	.10	.30	.25	Balance	Oxides of Aluminum (Al), Calcium (Ca), Magnesium (Mg), Potassium (K), Sodium (Na), and Titanium (Ti), in Various Compounds
6011	E6011	.08	.35	.25	Balance	
6013	E6013	.09	.50	.25	Balance	
7014	E7014	.08	.70	.45	Balance	
7024	E7024	.07	.90	.45	Balance	

**Table 2 — McKAY MILD STEEL LOW HYDROGEN ELECTRODES**  
To AWS A5.1, Specification for Carbon Steel Covered Arc Welding Electrodes

McKAY GRADE	AWS CLASS	TYPICAL DEPOSIT CHEMISTRY, %				OTHER INGREDIENTS
		Carbon C	Manganese Mn	Silicon Si	Iron Fe	
7016	E7016	.06	.80	.30	Balance	Same as Table 1 plus Calcium Fluoride (CaF <sub>2</sub> )
7016 XLM	E7016	.06	1.10	.50	Balance	
7016-1 XLM	E7016	.07	1.35	.50	Balance	

**Table 3 — McKAY MILD STEEL "SPEED-ALLOY" WIRES**  
To AWS A5.20, Specification for Carbon Steel Electrodes for Flux-Cored Arc Welding  
-V Types for flat, horizontal and vertical with CO<sub>2</sub> or 75/25 Argon-CO<sub>2</sub> shielding. Other  
Types for flat and horizontal with CO<sub>2</sub> shielding

McKAY GRADE	AWS CLASS	TYPICAL DEPOSIT CHEMISTRY, %				OTHER INGREDIENTS
		Carbon C	Manganese Mn	Silicon Si	Iron Fe	
71	E70T-1	.08	1.35	.50	Balance	Most of the following: Oxides of Aluminum (Al), Calcium (Ca), Potassium (K), Sodium (Na), Titanium (Ti), and Fluorides (CaF <sub>2</sub> or others).
71-V	E71T-1	.07	1.35*	.45	Balance	
75	E70T-5	.08	1.25	.50	Balance	
77	E70T-G	.07	1.40*	.40	Balance	

\* We recommend air monitoring for these. See Sections 5 and 6 and the labels on the product containers.

**Table 4 — McKAY LOW ALLOY LOW HYDROGEN COVERED ELECTRODES**  
To AWS A5.5, Specification for Low Alloy Steel Arc Welding Electrodes

McKAY GRADE	AWS CLASS	TYPICAL DEPOSIT CHEMISTRY, %								OTHER INGREDIENTS
		Carbon C	Manganese Mn	Silicon Si	Chromium Cr	Nickel Ni	Molybdenum Mo	Copper Cu	Iron Fe	
7018-A1 XLM	E7018-A1	.06	.80	.45			.50		Balance	Oxides of Aluminum (Al), Calcium (Ca), Magnesium (Mg), Potassium (K), Sodium (Na), Strontium (Sr), Titanium (Ti), and Calcium Fluoride (CaF <sub>2</sub> )
7018-C2L XLM	E7018-C2L	.04	.85	.40		3.30			Balance	
8018-G XLM	E8018-G	.08	1.30	.45			.20		Balance	
8018-W XLM	E8018-W	.07	.80	.45	.80	.50		.50	Balance	
8018-B2L XLM	E8018-B2L	.04	.80	.35	1.25		.50		Balance	
8018-C3 XLM	E8018-C3	.05	.90	.45		.95			Balance	
8018-C1 XLM	E8018-C1	.06	.90	.45		2.30			Balance	
8018-C2 XLM	E8018-C2	.06	.85	.40		3.30			Balance	
9018-M XLM	E9018-M	.08	1.00	.40		1.80	.20		Balance	
9018-B3 XLM	E9018-B3	.07	.80	.35	2.25*		1.05		Balance	
9018-B3L XLM	E9018-B3L	.04	.80	.35	2.25*		1.05		Balance	
10018-M XLM	E10018-M	.06	1.25	.40	.10	1.55	.30		Balance	
10018-O2 XLM	E10018-O2	.11	1.85	.45		.75	.35		Balance	
11018-M XLM	E11018-M	.07	1.50	.40		1.80	.40		Balance	
12018-M XLM	E12018-M	.07	1.50	.40	.45	2.00	.40		Balance	
502-18**	E502-18	.08	.80	.40	5.00*		.50		Balance	
505-18**	E505-18	.06	.80	.45	9.25*		1.00		Balance	

\* We recommend air monitoring for these. See Sections 5 and 6 and the labels on the product containers.

\*\* These grades are now in AWS A5.4 but will be removed from there and put in AWS A5.5 as E502-18 and E505-18 respectively.

*Max 4.1 30.0 49 1.4*

**Table 13—McKAY "TUBE-ALLOY-S" CORED HARDSURFACING WIRES**  
For submerged arc hardsurfacing of steel parts

McKAY GRADE	TYPICAL DEPOSIT CHEMISTRY, %											OTHER INGREDIENTS
	Carbon C	Manganese Mn	Silicon Si	Chromium Cr	Nickel Ni	Molybdenum Mo	Titanium Ti	Vanadium V	Tungsten W	Copper Cu	Iron Fe	
238-S	.17	1.6	.8		5.3	5.5					Balance	Some of these wires contain titanium dioxide (TiO <sub>2</sub> ) and alumina (Al <sub>2</sub> O <sub>3</sub> ) see footnote * on fluorides.
242-S	.16	1.9	.8	1.6		.8		22			Balance	
250-S	.23	1.3	.8	11.5							Balance	
252-S	.20	2.1	.9	3.5							Balance	
255-S	4.5	3.0	.8	29							Balance	
258-S	.35	1.3	.8	8.2		1.8			1.3		Balance	
420M-S	.25	1.2	.7	14							Balance	
821-S	.16	1.2	.8	5.6		1.4			1.3		Balance	
BU-S	.12	1.8	.8	.7							Balance	

\* We recommend air monitoring for Fluorides, which comes from the flux. See Sections 5 and 6 and the labels on the product containers.

**Table 14—McKAY SPECIAL MAINTENANCE ELECTRODES AND WIRES**

McKay Grade	Electrode or Wire	Typical Deposit Chemistry, %									Other Ingredients
		Carbon C	Manganese Mn	Silicon Si	Chromium Cr	Nickel Ni	Molybdenum Mo	Tungsten W	Vanadium V	Iron Fe	
McKay GP	Electrode	.06	1.0	.5	26.5*	9.0				Balance	Most contain oxides and/or fluorides (F) of: Aluminum (Al) Calcium (Ca) Magnesium (Mg) Potassium (K) Sodium (Na) Titanium (Ti)
McKay GP-O	Wire	.07	1.5	.8	30*	9.0				Balance	
Hardalloy 120	Electrode	.06	1.0	.5	23.5*	9.8				Balance	
Frogalloy	Electrode	.4	4.1	.5	19.0*	9.5	1.4			Balance	
Frogalloy-O	Wire	.4	4.1	.5	19.2*	9.5	1.8			Balance	
McKay HW-T	Wire	.4	1.0	.8	5.0		1.5	1.3	.4	Balance	
McKay C	Electrode	.03	.8	.4	15.5*	Balance	16.0	3.8		3.5	
McKay C-O	Wire	.04	.8	.8	15.5*	Balance*	16.0	4.0		3.5	
McKay-C-S*	Wire	.01	.8	.8	14.3	Balance	15.3	3.8		3.5	

\* We recommend air monitoring for these, and also for Fluorides (primarily from the flux) on the C-S wire. See Sections 5 and 6 and the labels on the product containers.

**Table 15—McKAY ELECTRODES FOR CAST IRON**  
To AWS A5.15, Specification for Welding Rods and Covered Electrodes for Cast Iron

McKAY GRADE	AWS CLASS	TYPICAL DEPOSIT CHEMISTRY, %						OTHER INGREDIENTS
		Carbon C	Manganese Mn	Silicon Si	Copper Cu	Iron Fe	Nickel Ni	
Cast-Alloy	ENi-C1	1.1	.4	2.7	1.4	5.5	Balance	Oxides and/or Fluorides (F) of: Aluminum (Al), Boron (B), Calcium (Ca), Magnesium (Mg), Silicon (Si), Sodium (Na), Strontium (Sr), and Zirconium (Zr)
Cast-Alloy 80	ENiFe-C1	1.3	.5	.8		Balance	49	
Cast-Alloy T-60	ENiFe-C1	1.3	.2	.8		Balance	46	

**Section 3 — PHYSICAL/CHEMICAL CHARACTERISTICS**  
**Section 4 — FIRE AND EXPLOSION HAZARD DATA**

**Physical/Chemical Characteristics:**

These products as shipped are nonhazardous, nonflammable, nonexplosive and nonreactive.

**Fire and Explosion Hazard Data:**

The welding arc and sparks (spatter) can ignite combustible and flammable materials.

**Section 5 — REACTIVITY DATA — HAZARDOUS\* DECOMPOSITION PRODUCTS**

"The term "hazardous" should be interpreted as a term required and defined in the OSHA Hazard Communication Standard (29 CFR Part 1910.1200) and does not necessarily imply the existence of any hazard.

These products as shipped are stable, nonhazardous, nonflammable, nonexplosive and nonreactive.

Welding fumes and gases cannot be classified simply. The composition and quality of both are dependent upon the metal being welded, the process, procedure and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

Most fume ingredients are present in complex combinations, rather than as separate compounds. Excessive exposures may produce the effects outlined in Section 6, Health Hazard Data, for Welding Fumes (TLV of 5 mg/m<sup>3</sup>).

Some fume ingredients have low PELs/TLVs and represent special potential health hazards, described in Section 6. Teledyne McKay recommends monitoring all chemicals marked with an asterisk (\*) in Section 2. Where monitoring is suggested, these chemicals are specifically shown on the product labels under the heading "Limits on Fume Exposure". In those cases, they will or may exceed their PEL/TLV before the total welding fume exceeds its TLV of 5 mg/m<sup>3</sup>.

Table 1—McKAY MILD STEEL ELECTRODES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENT)
All grades, Table 1, Section 2	Complex oxide combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for the oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume (or 5 mg/m <sup>3</sup> of total respirable dust).

Table 2—McKAY MILD STEEL LOW HYDROGEN ELECTRODES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENT)
All grades, Table 2, Section 2	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for gaseous fluorides and/or oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume (or 5 mg/m <sup>3</sup> of total respirable dust).

Table 3—McKAY MILD STEEL "SPEED-ALLOY" WIRES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS)
All grades, Table 3, Section 2	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for oxides of nitrogen and/or gaseous fluorides and/or carbon monoxide.	5 mg/m <sup>3</sup> of Welding Fume
			1 mg/m <sup>3</sup> of manganese on grades with an * on Mn in Table 3, Section 2

Table 4—McKAY LOW ALLOY LOW HYDROGEN ELECTRODES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS)
All grades, Table 4, Section 2	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for gaseous fluorides and/or oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume
			0.05 mg of Cr VI/m <sup>3</sup> on grades with an * on Cr in Table 4, Section 2

Table 5—McKAY LOW ALLOY "SPEED-ALLOY" WIRES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS)
All grades, Table 5, Section 2	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for oxides of nitrogen and/or gaseous fluorides and/or carbon monoxide.	5 mg/m <sup>3</sup> of Welding Fume
			1 mg/m <sup>3</sup> of manganese on grades with an * on Mn in Table 5, Section 2

Table 6—McKAY STAINLESS STEEL ELECTRODES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS)
All grades, Table 6, Section 2	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for gaseous fluorides and/or oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume
			0.05 mg/m <sup>3</sup> of Cr VI on all grades in Table 6, Section 2
			1 mg/m <sup>3</sup> of manganese on grades with an * on Mn in Table 6, Section 2
			0.1 mg/m <sup>3</sup> of copper on grades with an * on Cu in Table 6, Section 2

Table 7—McKAY STAINLESS STEEL WIRES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS)
All grades, Table 7, Section 2	Complex oxide combinations of all wire ingredients	Normally low. If any symptoms indicate the need, check for ozone and/or oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume
			0.05 mg/m <sup>3</sup> of Cr VI plus III on all grades in Table 7, Section 2
			0.1 mg/m <sup>3</sup> of copper on grades with an * on Cu in Table 7, Section 2
			1 mg/m <sup>3</sup> of manganese on grades with an * on Mn in Table 7, Section 2

Table 14—McKAY SPECIAL MAINTENANCE ELECTRODES AND WIRES

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS) FOLLOWING APPLY TO BOTH ELECTRODES AND WIRES.
All grades, Table 14, Section 2 ELECTRODES	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume 0.05 mg/m <sup>3</sup> of Cr VI on all grades with an * on chromium in Table 14, Section 2
All grades, Table 14, Section 2 WIRES	Complex oxide and fluoride combinations of all wire ingredients	Normally low. If any symptoms indicate the need, check for oxides of nitrogen and/or gaseous fluorides and/or carbon monoxide and/or ozone	1.0 mg/m <sup>3</sup> of nickel on all grades with an * on the nickel in Table 14, Section 2 5 mg/m <sup>3</sup> of Welding Fume 0.05 mg/m <sup>3</sup> of Cr VI on all grades with an * on chromium in Table 14, Section 2

Table 15—McKAY ELECTRODES FOR CAST IRON

McKAY GRADES	FUMES TO BE EXPECTED	GASES TO BE EXPECTED	RECOMMENDED AIR MONITORING (TLV OR PEL AND INGREDIENTS)
All grades, Table 15, Section 2	Complex oxide and fluoride combinations of all electrode ingredients	Normally low. If any symptoms indicate the need, check for oxides of nitrogen.	5 mg/m <sup>3</sup> of Welding Fume (or 5 mg/m <sup>3</sup> of total respirable dust).

## Section 6—EXPOSURE LIMITS AND HEALTH HAZARD INFORMATION

**ROUTE OF ENTRY:** The major route of entry of these fumes and gases is by inhalation. Where dermatitis or allergies are involved, it may also be by skin contact.

**AGGRAVATION** of preexisting respiratory or allergic conditions may occur in some workers. Some studies have shown a higher level of lung related problems among older welders who smoked than those who did not smoke. Where exposure data is available, it shows excessive overexposures to welding fumes.

**EMERGENCY AND FIRST AID:** Remove from exposure and obtain prompt medical attention. If victim is unconscious, administer oxygen. If not breathing, resuscitate immediately. Employ first aid techniques recommended by American Red Cross.

Teledyne McKay recommends monitoring the fumes (and gases) for the components marked with an asterisk (\*) in Section 2. These components are also specifically shown on the individual product labels under the heading "Limits on Fume Exposure." These are the components most likely to exceed their limits before the total welding fume exceeds its recommended limit.

## MOST WELDING FUMES

For virtually all carbon steel (mild steel), most low alloy, and some special welding electrodes, the ACGIH Welding Fumes—Total Particulate (not otherwise classified) TLV of 5 mg/m<sup>3</sup> will be exceeded well before the PEL or TLV for any individual chemical in the fume is exceeded. The welding fume may contain many of the following chemicals. These will not be listed in the detailed Health Hazard Data Table presented later in this Section because (1) they are not present in the pure form, but only as complex combinations with many of the other ingredients (they can be considered pseudo minerals) and (2) they will be below their PEL or TLV when the total welding fume reaches its TLV of 5 mg/m<sup>3</sup>. This MSDS and our product labels show all exceptions to this general rule.

Note that many of the metals and chemicals listed in the Health Hazard Data Table later in this section are also present in many or most of these welding fumes, but at levels such that the 5 mg/m<sup>3</sup> for Welding Fumes is the critical exposure to monitor.

METAL OR CHEMICAL	SYMBOL	CAS NUMBER	METAL OR CHEMICAL	SYMBOL	CAS NUMBER
Aluminum	Al	7429-90-5	Potassium oxide	K <sub>2</sub> O	12136-47-7
Aluminum oxide	Al <sub>2</sub> O <sub>3</sub>	1344-28-1	Silicon	Si	7440-21-3
Barium	Ba	7440-39-3	Silicon oxide (amorphous)	SiO <sub>2</sub>	7631-86-9
Barium oxide	BaO	1304-28-5	Sodium	Na	7440-23-5
Columbium (Niobium)	Cb (Nb)	7440-03-1	Sodium oxide	Na <sub>2</sub> O	1313-59-3
Cb or Nb oxide	Cb <sub>2</sub> O <sub>5</sub> (Nb <sub>2</sub> O <sub>5</sub> )	1313-96-8	Strontium	Sr	7440-24-6
Calcium	Ca	7440-70-2	Strontium oxide	SrO	1314-11-0
Calcium oxide	CaO	1305-78-8	Titanium	Ti	7440-32-6
Calcium fluoride	CaF <sub>2</sub>	7789-75-5	Titanium oxide	TiO <sub>2</sub>	13463-67-7
Lithium	Li	7439-92-2	Tungsten	W	7440-33-7
Lithium oxide	Li <sub>2</sub> O	12057-24-8	Tungsten oxide	Several	39318-18-8
Magnesium	Mg	7439-95-4	Vanadium	V	7440-82-2
Magnesium oxide	MgO	1309-48-4	Vanadium oxide	V <sub>2</sub> O <sub>5</sub>	1314-62-1
Molybdenum	Mo	7439-98-7	Zirconium	Zr	7440-67-7
Molybdenum oxide	MoO <sub>3</sub>	18868-43-4	Zirconium oxide	ZrO <sub>2</sub>	1314-23-4
Potassium	K	7440-09-7			

## FUMES OF SPECIAL CONCERN

Some electrodes contain alloying elements which may or do reach their PEL or TLV in the fumes before the total welding fumes reach 5 mg/m<sup>3</sup>. These special cases are shown both on the product labels for each container of electrodes and in Section 2 of this MSDS by means of an asterisk (\*). (See also the Teledyne McKay Safety and Health Bulletin of August 1985, or later for a more detailed discussion.) The elements or compounds of concern are also listed in the table later in Section 5 and in the tables in this section.

Chromium and nickel when present in the electrodes are of special interest. The OSHA Hazard Communication Standard (29 CFR 1910.1200) deems them to be human carcinogens because they are on the IARC and NTP lists of suspect or proven carcinogens. Also, OSHA regards some chromium VI compounds as carcinogenic. Certain chromium and certain nickel compounds have been clearly shown to be animal and human carcinogens, however these compounds have not been found in welding fumes. We believe that there are no reliable scientific studies which show that stainless steel welders or any welders or workers exposed to alloys containing significant chromium and/or nickel run increased risks of lung cancer because of their exposure to the forms of chromium and nickel found in the fumes.

#### WELDING GASES

Gases are produced during welding. The important ones are listed for the process and product in Section 5 of this MSDS. A table which follows in this section lists their PELs and TLVs and their effects.

#### HEALTH HAZARD TABLES

The following tables show the compounds which have been discussed previously and which may be encountered, their names and formulas, their CAS number, shows the maximum allowable exposure limits per OSHA (PELs) and ACGIH (TLVs), and briefly describes possible known short term and long term health effects which may result from excessive exposure. (Sources — McKay Health Hazard Determination, TSCA list for CAS numbers, NIOSH/OSHA Pocket Guide to Chemical Hazards, and ACGIH Documentation of the Threshold Limit Values)

NAME OF COMPOUND, FORMULA AND CAS NUMBER	ALLOWABLE EXPOSURE LIMIT AS ELEMENT UNLESS OTHERWISE INDICATED PEL (OSHA) TLV (ACGIH)	ON ANY CARCINOGENS LIST? IF SO, WHICH ONES?	HEALTH EFFECTS RESULTING FROM EXCESSIVE EXPOSURES	
			Acute (Short Term)	Chronic (Long Term)
WELDING FUMES AND COMPONENTS OF WELDING FUMES				
Welding Fumes (Not otherwise classified)	PEL-equivalent is 5 mg/m³ for any respirable mineral inert or nuisance dust (Table Z-3)	No	May include metallic taste, nausea, tightness of chest, fever, dizziness, dryness or irritation of eyes, nose or throat.	Excessive levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis"
CAS No.—none	TLV—5 mg/m³		See also gases shown later in this table—Some of the above effects may come from the gases present.	
The following specific fume components are listed roughly in their order of their estimated importance in terms of frequency of occurrence and/or potential hazard.				
Manganese—Mn CAS no. 7439-96-5 Manganese dioxide—MnO₂ CAS No. 1313-13-9	PEL—5 mg/m³ as ceiling (maximum at any time) TLV for fume—1 mg/m³ as Mn	No	Can include metal fume fever, dry throat, coughing, tight chest, low back pain, vomiting, fatigue, headache.	"Manganism". Sensitivity varies. Affects central nervous system. Muscular weakness, tremors, symptoms similar to Parkinson's disease. Exposed employees should get quarterly medical examinations for manganism.
Chromium VI—Cr VI Sodium Chromate Na₂CrO₃ (soluble) CAS No. 7775-11-3 Potassium Chromate K₂CrO₃ (soluble) CAS No. 7789-00-6	PEL—0.05 mg/m³ as Cr VI (Table Z-2 is 1 mg/10 m³ as CrO₃) TLV—0.05 mg/m³	Yes IARC NTP OSHA	Allergic reaction in some people. Irritation of mucous membranes.	Compounds are dissolved, and excreted or modified to Cr II or Cr III. Listed as suspect human carcinogen. Evidence from studies of welding and metallurgical process fumes containing chromium compounds do not confirm any carcinogenic effect.
Chromium—Cr CAS No. 7440-47-3 Chromium oxide (Cr II) CrO CAS No. 12018-00-7 Chromium oxide (Cr III) Cr₂O₃ CAS No. 1308-38-9	PEL—1 mg/m³ TLV—0.5 mg/m³	Yes IARC NTP	Allergic reactions in some people.	None known, but listed as a suspect human carcinogen on IARC and NTP lists. Evidence from studies of welding and metallurgical process fumes containing chromium II and III compounds do not confirm any carcinogenic effect.
Nickel—Ni CAS No. 7440-02-0 Nickel oxide—NiO CAS No. 1313-99-1	PEL—1 mg/m³ TLV—1 mg/m³	Yes IARC NTP	Allergic reactions in some people. Metallic taste, nausea, tightness in chest, metal fume fever.	None known, but listed as a suspect human carcinogen on IARC and NTP lists. Evidence from studies of welding and metallurgical process fumes containing nickel compounds do not confirm any carcinogenic effect.

NAME OF COMPOUND, FORMULA AND CAS NUMBER	ALLOWABLE EXPOSURE LIMIT AS ELEMENT UNLESS OTHERWISE INDICATED PEL (OSHA) TLV (ACGIH)	ON ANY CARCINOGENS LIST? IF SO, WHICH ONES?	HEALTH EFFECTS RESULTING FROM EXCESSIVE EXPOSURES	
			Acute (Short Term)	Chronic (Long Term)
WELDING FUMES AND COMPONENTS OF WELDING FUMES				
The following specific fume components are listed roughly in their order of their estimated importance in terms of frequency of occurrence and/or potential hazard.				
Calcium Fluoride CaF <sub>2</sub> (insoluble) CAS No. 14542-23-5 Sodium Fluoride Na F (soluble) CAS No. 7681-49-4 Potassium Fluoride K F (soluble) CAS No. 7789-23-3 Aluminum Fluoride Al F <sub>3</sub> (insoluble) CAS No. 7784-18-1 Lithium Fluoride Li F (slightly soluble) CAS No. 7789-24-4	PEL — 2.5 mg/m <sup>3</sup> (as fluo-rine) TLV — 2.5 mg/m <sup>3</sup> (as fluo-rine)	No	CaF <sub>2</sub> probably inert. Solu-ble fluorides may be irri-tants and corrosive to mucous membranes.	Soluble portions may cause osteoporosis and mottling of teeth, but effects seem reduced in presence of iron as in welding electrode fume.
Iron—Fe CAS No. 7439-89-6 Iron Oxide — FeO CAS No. 1345-25-1 Iron Oxide — Fe <sub>2</sub> O <sub>3</sub> CAS No. 1309-37-1 Iron Oxide — Fe <sub>3</sub> O <sub>4</sub> CAS No. 1309-38-2	PEL — 5 mg/m <sup>3</sup> TLV — 10 mg/m <sup>3</sup> (Note — should be re-garded as 5 mg/m <sup>3</sup> if present in respirable fume — and welding fume is respirable)	No	Probably none, except as nuisance dust.	Possible siderosis if expo-sures are excessive and long term. Regarded as be-nign. Lungs clear gradually after exposure is ended.
Copper — Cu CAS No. 7440-50-8 Copper oxide — CuO CAS No. 1317-38-0	PEL — 0.1 mg/m <sup>3</sup> for fume TLV — 0.2 mg/m <sup>3</sup> for fume	No	Metal fume fever, muscle ache, respiratory irritant.	None known.
Cobalt — Co CAS No. 7440-48-4 Cobalt Oxide — CoO CAS No. 1307-9606	PEL — 0.1 mg/m <sup>3</sup> TLV — 0.05 mg/m <sup>3</sup>	No	Pulmonary irritant, cough, dermatitis.	Possible lung fibrosis and respiratory hypersensitivity.
GASES GENERATED BY ARC WELDING PROCESSES				
Fluorides, such as Silicon Tetrafluoride SiF <sub>4</sub> CAS No. 7783-61-1 Hydrogen fluoride HF CAS No. 7664-39-3	See soluble fluorides portion under Welding Fumes.			
Nitric oxide — NO CAS No. 12102-43-9	PEL — 25 ppm TLV — 25 ppm	No	Irritant to mucous mem-branes, drowsiness.	Chronic respiratory disease.
Nitrogen dioxide NO <sub>2</sub> CAS No. 10102-44-2	PEL — 5 ppm TLV — 3 ppm	No	Irritant to mucous mem-branes, coughing, chest pain, pulmonary edema.	Chronic respiratory disease.
Ozone — O <sub>3</sub> CAS No. 10028-15-6	PEL — 0.1 ppm (0.2 mg/m <sup>3</sup> ) TLV — same as PEL. Also 0.3 ppm and 0.6 mg/m <sup>3</sup> ceiling limits.	No	Irritant to mucous mem-branes, pulmonary edema.	Chronic respiratory disease.
Carbon monoxide — CO CAS No. 630-08-0	PEL — 50 ppm (55 mg/m <sup>3</sup> ) TLV — same as PEL	No	Headache, rapid breathing, oxygen deprivation, confu-sion, dizziness, weakness	Oxygen deprivation.
Argon — A Carbon dioxide — CO <sub>2</sub> Helium — He Nitrogen — N	Regarded as simple as-phyxiants	No	Inert gases which may replace air and deprive the body of oxygen. (CO <sub>2</sub> is not inert but effect is as above)	

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## Section 7 — PRECAUTIONS FOR SAFE HANDLING AND USE

## Section 8 — CONTROL MEASURES

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Welding hazards are complex. Available accident and health records show that the great majority of the recorded problems result from physical accidents (sometimes due to electric shock or restricted visibility/mobility), physical strains, radiation burns such as eye "flash", heat burns due to hot metal or spatter, or metal fume fever.

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, FL 33135, the OSHA Publication 2206 (29CFR1910), US Government Printing Office, Washington, D. C. 20402 and the Teledyne McKay Safety and Health Bulletin of August 1985 or later for more detail on many of the following.

**EXPOSURES:** Maintain all exposures below the limits shown on the warning on the package and on the product label. Use industrial hygiene air monitoring to ensure acceptable exposures. Always use exhaust ventilation.

**VENTILATION:** Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. If fumes are removed by filtration or some other means and the air/gas stream put back in the room, the toxic gas levels may build up to undesirable levels. Toxic gases should be monitored, and/or be removed by some effective supplementary device, and/or reduced by general ventilation.

**RESPIRATORY PROTECTION:** Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the PEL or TLV.

**EYE PROTECTION:** Wear helmet or use face shield. As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade (a lower number shade) which gives sufficient view of the weld zone. See Z49.1 mentioned earlier in this section if more details are needed.

**PROTECTIVE CLOTHING:** Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing.

**ELECTRICAL:** Train welder to avoid electrical shock by maintaining a dry work area, insulating himself from work and ground, and not touching live electrical parts.

**WASTE DISPOSAL:** Dispose of fume or flux or welding grinding residues from the work area or from filters in accordance with EPA or local regulations. Refer to Section 2 for information on components in the flux and to Sections 5 and 6 for information on components in the fumes.

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Teledyne McKay believes this information to be accurate and to reflect qualified expert opinion regarding research available to this date. However, Teledyne McKay cannot make any express or implied warranty as to this information.



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P. O. Box 1509  
York, PA 17405-1509

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DATE RECEIVED 11/25/81

JUN 25 1980

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OSHA No. 101-106

J. L. CLARK, ATLAS TUBE DIV  
DOWNERS GROVE, ILL

## MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

### SECTION I

MANUFACTURER'S NAME		EMERGENCY TELEPHONE NO.
THERMACOTE-WELCO CO.		1-704-739-6421
ADDRESS		
Box 141 YORK ROAD, KINGS MOUNTAIN, N.C. 28086		
CHEMICAL NAME AND SYNONYMS		TRADE NAME AND SYNONYMS
LOW FINISH BRONZE		WELCO 15 and 15FC
CHEMICAL FAMILY	FORMULA	
Br-Cu-Zn-Si	57% Cu 1.0% Sn 0.1% Si bal. Zn	

### SECTION II. HAZARDOUS INGREDIENTS\*

**IMPORTANT!** This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered in Section V.

Material (CAS No.)	Weight %	Exposure Limit	
		1984 85 TLV-TWA	(OSHA PEL)
WELCO 15	Less Than		
Copper (7440-50-8)	60.0	.2 mg/m <sup>3</sup>	(.1 mg/m <sup>3</sup> )
Iron (7439-89-6)	1.5	5 mg/m <sup>3</sup> Fe <sub>2</sub> O <sub>3</sub> as Fe	(10 mg/m <sup>3</sup> )
Tin (7440-31-5)	3.0	2 mg/m <sup>3</sup>	
Zinc (7440-66-6)	Bal.	5 mg/m <sup>3</sup> as oxide fume	
WELCO 15FC			
Copper (7440-50-8)	60.0	.2 mg/m <sup>3</sup>	(.1 mg/m <sup>3</sup> )
Iron (7439-89-6)	1.5	5 mg/m <sup>3</sup> Fe <sub>2</sub> O <sub>3</sub> as Fe	(10 mg/m <sup>3</sup> )
Tin (7440-31-5)	3.0	2 mg/m <sup>3</sup>	
Zinc (7440-66-6)	40.0	5 mg/m <sup>3</sup> as oxide fume	
Boric Acid (10043-35-3)	5.0	5 mg/m <sup>3</sup> (NOC)	
Borax Glass (1303-96-4)	20.0	1 mg/m <sup>3</sup>	

\*The term "hazardous" should be interpreted as a term required and defined in the OSHA Hazard Communications Standard (29CFR 1910.1200) and does not necessarily imply the existence of any hazard. Some of the products listed may not contain all of the ingredients shown in Section II. Typical analyses can be found in the appropriate AWS Specification or from your supplier.

### SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Appearance: WELCO 15 - bare, solid bronze rods.  
WELCO 15FC bronze rods coated with white flux.

### SECTION IV. FIRE & EXPLOSION HAZARD DATA

Non-flammable. Welding arc and sparks can ignite combustible and flammable products. See ANSI Z49.1 "Safety in Welding and Cutting" referenced in Section III for fire prevention and protection information.



## SECTION V. REACTIVITY DATA

## Gaseous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the rod is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include:

Primarily oxides of Copper and Zinc. Secondarily complex oxides of Iron, Tin, Boron and Sodium.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI AWS F 1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes" available from the American Welding Society, P. O. Box 351040, Miami, FL 33135.

## SECTION VI. HEALTH HAZARD DATA

**THRESHOLD LIMIT VALUE:** The ACGIH 1984-85 recommended limit for welding fume, not otherwise classified (NOC) is  $5 \text{ mg m}^{-3}$ . TLV-TWA's should be used as a guide in the control of health hazards and not as line lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV-TWA.

**EFFECTS OF OVEREXPOSURE:** Electric arc welding or oxy-fuel gas processes may create one or more of the following hazards.

- **FUMES & GASES** can be dangerous to your health. Primary route of entry is by inhalation.
  - Short term/acute overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of the nose, throat, and eyes.
  - Long term/chronic overexposure to welding fumes can lead to siderosis (iron deposits in lung) and affect pulmonary function.
- **ARC RAYS** can injure eyes and burn skin. **HEAT RAYS** (infrared radiation from flame or hot metal) can injure eyes.
- **ELECTRIC SHOCK** can kill.
- **NOISE** can damage hearing.
- **CARCINOGENIC ASSESSMENT:** N/A
- **EMERGENCY FIRST AID PROCEDURES:** Call for medical aid. Employ first aid techniques recommended by the American Red Cross. **IF BREATHING IS DIFFICULT**, give oxygen. Call a physician. **IN CASE OF ELECTRICAL SHOCK** disconnect and turn off power. **IF NOT BREATHING**, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin external heart massage. Immediately call a physician. **IN CASE OF ARC BURN**, call a physician.

## SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, Safety in Welding and Cutting, published by the American Welding Society, P. O. Box 351040, Miami, FL 33135, OSHA Publication 2206 (29CFR1910), U. S. Government Printing Office, Washington, D. C. 20402;

- **VENTILATION:** Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select as per OSHA 29 CFR 1910.134.
- **EYE PROTECTION:** Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade that is too dark to see the weld zone and then go to the next lighter shade (See ANSI Z 49.1). Provide protective screens and flash goggles, if necessary, to shield others.
- **PROTECTION CLOTHING:** Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z 49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.
- **WASTE DISPOSAL:** Dispose any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.

# 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER.....:

EM SCIENCE  
A DIVISION OF EM INDUSTRIES  
P.O. BOX 70  
480 DEMOCRAT RD.  
GIBBSTOWN, N.J. 08027

PREPARATION DATE.: 03/01/91  
DATE MSDS PRINTED.: JUN 11, 1992

INFORMATION PHONE NUMBER.: 609-354-9200  
HOURS: MON. TO FRI. 8:30-5  
CHEMTREC EMERGENCY NUMBER: 800-424-9300  
HOURS: 24 HRS A DAY

CATALOG NUMBER(S):

FX0325 FX0330 FX0334 FX0335

CHEMICAL NAME.....: FLUORESCEIN (SODIUM SALT)  
TRADE NAME.....: ACID YELLOW 73; URANINE; C.I. #45350  
CHEMICAL FAMILY...: XANTHENE DYE  
FORMULA.....: C20H10NA2O5

MOLECULAR WEIGHT.: 376.28

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS #	APPR %
FLUORESCEIN (SODIUM SALT)	518-47-8	100%

## 3. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

HANDLING CARE GENERALLY IN KEEPING WITH SAFE LABORATORY PRACTICES IS RECOMMENDED.

APPEARANCE.....:

YELLOW TO ORANGE/RED  
ODORLESS POWDER

### POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

#### SYMPTOMS OF EXPOSURE:

-ORAL TOXICITY LOW  
MAY CAUSE SKIN IRRITATION OR DERMATITIS ON PROLONGED CONTACT

MSDS (CONTINUED) - FX0325 PAGE # 1

MEDICAL COND. AGGRAVATED BY EXPOSURE:

DATA NOT AVAILABLE.

ROUTES OF ENTRY.....:

INHALATION, INGESTION OR SKIN CONTACT.

ARCINOGENICITY.....:

THE MATERIAL IS NOT LISTED (IARC, NTP, OSHA) AS CANCER CAUSING AGENT.

#### 4. FIRST AID MEASURES

##### EMERGENCY FIRST AID:

SKIN: WASH THOROUGHLY WITH SOAP AND WATER.

EYES: IMMEDIATELY FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES.

INHALATION: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.

INGESTION: IF CONSCIOUS, DRINK WATER AND INDUCE VOMITING

IMMEDIATELY AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.

#### 5. FIRE FIGHTING MEASURES

FLASH POINT (F).....: N/A

FLAMMABLE LIMITS LEL (%): N/A

FLAMMABLE LIMITS UEL (%): N/A

EXTINGUISHING MEDIA.....:

WATER SPRAY, CO<sub>2</sub>, DRY CHEMICAL

FIRE FIGHTING PROCEDURES.:

WEAR SELF-CONTAINED BREATHING APPARATUS.

FIRE & EXPLOSION HAZARDS.:

-NONE

#### 6. ACCIDENTAL RELEASE MEASURES

##### SPILL RESPONSE:

EVACUATE THE AREA OF ALL UNNECESSARY PERSONNEL.

WEAR SUITABLE PROTECTIVE EQUIPMENT LISTED UNDER EXPOSURE / PERSONAL PROTECTION.

ELIMINATE ANY IGNITION SOURCES UNTIL THE AREA IS DETERMINED TO BE FREE FROM EXPLOSION OR FIRE HAZARDS.

CONTAIN THE RELEASE AND ELIMINATE ITS SOURCE, IF THIS CAN BE DONE WITHOUT RISK.

TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL AS DESCRIBED UNDER DISPOSAL.

COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS ON REPORTING

RELEASES. REFER TO REGULATORY INFORMATION FOR REPORTABLE  
QUANTITY AND OTHER REGULATORY DATA.

## 7. HANDLING AND STORAGE

### HANDLING & STORAGE:

KEEP CONTAINER CLOSED.  
STORE IN A DRY, WELL-VENTILATED AREA  
DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING  
DO NOT BREATHE DUST.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

VENTILATION, RESPIRATORY PROTECTION, PROTECTIVE CLOTHING, EYE PROTECTION  
MATERIAL SHOULD BE HANDLED OR TRANSFERRED IN AN APPROVED FUME  
HOOD OR WITH ADEQUATE VENTILATION.  
PROTECTIVE GLOVES (NATURAL RUBBER, NEOPRENE, PVC OR EQUIVALENT)  
SHOULD BE WORN TO PREVENT SKIN CONTACT  
SAFETY GLASSES WITH SIDE SHIELDS SHOULD BE WORN AT ALL TIMES.

### RK / HYGENIC PRACTICES:

WASH THOROUGHLY AFTER HANDLING.  
DO NOT TAKE INTERNALLY.  
EYE WASH AND SAFETY EQUIPMENT SHOULD BE READILY AVAILABLE.

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## EXPOSURE GUIDELINES

### OSHA - PEL:

COMPONENT	PPM	TWA MG/M3	PPM	STEL MG/M3	PPM	CL MG/M3	SKIN
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FLUORESCEIN (SODIUM SALT)

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### ACGIH - TLV:

COMPONENT	PPM	TWA MG/M3	PPM	STEL MG/M3	PPM	CL MG/M3	SKIN
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MSDS (CONTINUED) - FX0325

PAGE # 3

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FLUORESCEIN (SODIUM SALT)

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT (C 760 MMHG): N/A  
MELTING POINT (C): DECOMP  
SPECIFIC GRAVITY (H2O = 1): N/A  
VAPOR PRESSURE (MM HG): N/A 20C  
PERCENT VOLATILE BY VOL (%): N/A  
VAPOR DENSITY (AIR = 1): N/A  
EVAPORATION RATE (BUAC = 1): N/A  
SOLUBILITY IN WATER (%): SOLUBLE  
APPEARANCE: YELLOW TO ORANGE/RED  
ODORLESS POWDER

10. STABILITY AND REACTIVITY

STABILITY: YES  
HAZARDOUS POLYMERIZATION:  
DATA NOT AVAILABLE.

HAZARDOUS DECOMPOSITION.:  
COX, NA2O

CONDITIONS TO AVOID:

-NONE INDICATED

MATERIALS TO AVOID:

( ) WATER  
( ) ACIDS  
( ) BASES  
( ) CORROSIVES  
(X) OXIDIZERS  
( ) OTHER :

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:

-ORL-RAT LD50: 6721 MG/KG

TOXICOLOGICAL FINDINGS:

TESTS ON LABORATORY ANIMALS INDICATE MATERIAL MAY CAUSE TUMORS AND

MSDS (CONTINUED) - FX0325

PAGE # 4

MAY PRODUCE ADVERSE MUTAGENIC AND REPRODUCTIVE EFFECTS.  
CITED IN REGISTRY OF TOXIC EFFECTS OF SUBSTANCES (RTECS)

## 12. DISPOSAL CONSIDERATIONS

### EPA WASTE NUMBERS:

#### TREATMENT:

MATERIAL DOES NOT HAVE AN EPA WASTE NUMBER AND IS NOT A LISTED WASTE, HOWEVER CONSULTATION WITH A PERMITTED WASTE DISPOSAL SITE (TSD) SHOULD BE ACCOMPLISHED.  
ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

## 13. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME....:

NON-REGULATED

DOT ID NUMBER.....: NONE

## 14. REGULATORY INFORMATION

CA INVENTORY.....:

THE CAS NUMBER OF THIS PRODUCT IS LISTED ON THE TSCA INVENTORY.

COMPONENT	SARA EHS (302)	SARA EHS TPW (LBS)	CERCLA RC (LBS)
-----			
FLUORESCEIN (SODIUM SALT)			

COMPONENT	OSHA FLOOR LIST	SARA 313	DEMINIMIS FOR SARA 313 (%)
-----			
FLUORESCEIN (SODIUM SALT)			

## 15. OTHER INFORMATION

COMMENTS:

NONE

NFPA HAZARD RATINGS:

HEALTH : 0

FLAMMABILITY : 1

REACTIVITY : 0

SPECIAL HAZARDS:

REVISION HISTORY:

08/01/81 04/17/86 06/22/87 10/27/87

- = REVISED SECTION

N/A = NOT AVAILABLE

N/E = NONE ESTABLISHED

THE STATEMENTS CONTAINED HEREIN ARE OFFERED FOR INFORMATIONAL PURPOSES ONLY AND ARE BASED UPON TECHNICAL DATA THAT EM SCIENCE BELIEVES TO BE ACCURATE. IT IS INTENDED FOR USE ONLY BY PERSONS HAVING THE NECESSARY TECHNICAL SKILL AND AT THEIR OWN DISCRETION AND RISK. SINCE CONDITIONS AND MANNER OF USE ARE OUTSIDE OUR CONTROL, WE MAKE NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE.

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RECEIVED

MAR 29 1988

## J. T. BAKER CHEMICAL CO.

### MSDS INDEX

#### Volumes 1-5

\* *Sodium Chloride*

"Included are those J. T. Baker products for which Material Safety Data Sheets are NOT required according to the Federal Hazard Communications Standard (29 CFR 1910.1200)." These have been designated NR in this index.

NEW TELEPHONE NUMBER AND ADDRESS:

TELEPHONE NUMBER: (312) 388-4030

LA FINE SCIENTIFIC COMPANY

13636 WESTERN AV/PO BOX 780

BLUE ISLAND IL 60406-0780



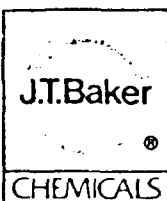
# J. T. Baker Chemical Co.

222 Red School Lane Phillipsburg, N.J. 08865  
24-Hour Emergency Telephone -- (201) 859-2151

Chemtec # (800) 424-9300  
National Response Center # (800) 424-8802

## MATERIAL SAFETY DATA SHEET

MSDS NO.	PRODUCT NAME	VOL.
S1250	Semicarbazide Hydrochloride, Crystal	3
S1570	SIC-L T M	5
S1586	Silica, DILUT-IT Analytical Concentrate, Standard, 1 g SiO	5
S1610	Silica Gel, Desiccant, Indicating (6-16 Mesh)	NR
S1622	Silica Gel G/HR	NR
S1634	Silica Gel 7, Powder	NR
S1658	Silica Gel 7G, Powder	NR
S1802	Silicic Acid, n-Hydrate, Powder	3
S1820	Silicon, 1000 ppm (0.100% w/v)	NR
S2018	Silicotungstic Acid, n-Hydrate, Crystal	3
S2088	Silver, 1000 ppm (0.100% w/v)	5
S2090	Silver, DILUT-IT Analytical Concentrate, Standard, 1 g Ag +	3
S2114	Silver Acetate, Powder	3
S2210	Silver Cyanide, Powder	3
S2234	Silver Diethyldithiocarbamate	NR
S2282	Silver Nitrate, Crystal	3
S2284	Silver Nitrate Standard Solution (1 mL = 1 mg Chloride)	3
S2285	Silver Nitrate, 0.1 N	3
S2287	Silver Nitrate, DILUT-IT Analytical Concentrate, N/10 (0.1N)	5
S2330	Silver Oxide	3
S2365	Silver Protein, Mild	5
S2378	Silver Sulfate, Powder	3
S2546	Soda Lime, Indicating Type, (4-8 Mesh)	3
S2590	Sodium, 1000 ppm (0.100% w/v)	5
S2592	Sodium, DILUT-IT Analytical Concentrate, Standard, 1 g Na +	NR
S2594	Sodium, Lump	5
S2666	Sodium Acetate, Trihydrate, Crystal	NR
S2670	Sodium Acetate, Anhydrous	3
S2810	Sodium Amide	3
S2834	Sodium Ammonium Phosphate, 4-Hydrate, Crystal	3
S2858	Sodium Arsenate, Dibasic, 7-Hydrate, Granular	3
S2882	Sodium Arsenite	3
S2906	Sodium Azide	5
S2930	Sodium Benzoate	NR
S2954	Sodium Bicarbonate, Powder	NR
S2962	Sodium Biphenyl Reagent	3
S3026	Sodium Bismuthate, Powder	NR
S3050	Sodium Bisulfate, Monohydrate, Crystal	NR
S3074	Sodium Bisulfite, Granular	3
S3098	Sodium meta-Bisulfite, Granular	NR
S3122	Sodium Borate, 10-Hydrate, Crystal	3
S3146	Sodium Borohydride (98%)	3
S3170	Sodium Bromide, Crystal	NR
S3242	Sodium Carbonate, Anhydrous, Granular	NR
S3245	Sodium Carbonate, Monohydrate, Crystal	NR
S3314	Sodium Chlorate, Crystal	3
* S3338	Sodium Chloride, Crystal	NR ←
S3342	Sodium Chloride, DILUT-IT Analytical Concentrate, N/10 (0.1N)	NR
S3345	Sodium Chloride, 0.9% w/v Solution	NR



# MATERIAL SAFETY DATA SHEET

246

J. T. Baker Chemical Co., 222 Red School Lane, Phillipsburg, N.J. 08865

CHEMICAL NAME

CHEMICAL NAME Nitric Acid		FORMULA HNO <sub>3</sub>	
SYNONYM OR CROSS REFERENCE		CAS NO: 7697-37-2 EPA NO:	
MATERIAL		NATURE OF HAZARD	
BOILING POINT approx. 244 to 251°F.		MELTING POINT	
VAPOR PRESSURE @ 68°F. (approx.) 3.0		SPECIFIC GRAVITY 1.41	
VAPOR DENSITY (AIR=1) 3.2		PERCENT VOLATILE BY VOLUME (%) 100%	
WATER SOLUBILITY Complete		EVAPORATION RATE (Butyl Acetate = 1) ~1	
APPEARANCE Colorless to light yellow (exposed to light) liquid with an acrid odor.			
FLASH POINT (method used) N.A.		FLAMMABLE LIMITS N.A.	
FIRE EXTINGUISHING MEDIA		Water spray	
SPECIAL FIRE-FIGHTING PROCEDURES Avoid inhalation of poisonous gaseous oxides of nitrogen. Filter type respirators are unsuitable. Use self-contained or air supplied breathing apparatus approved by NIOSH			
UNUSUAL FIRE AND EXPLOSION HAZARD Wood and other organics may ignite spontaneously or have greatly increased flammability. Can cause explosion with hydrogen sulfide, metallic powders, carbides and turpentine.			
THRESHOLD LIMIT VALUE 2 ppm by volume to 5 mg/M <sup>3</sup>			
HEALTH HAZARDS Will cause severe burns to skin or eyes. Inhalation of vapor or oxides of nitrogen is injurious to lungs. Symptoms may be delayed.			
FIRST AID PROCEDURES In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Call a physician-at once. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.			

# SECTION 3: HAZARD IDENTIFICATION

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

## INCOMPATIBILITY (materials to avoid)

Most metals, hydrogen sulfide, wood, excelsior, paper, cotton and organics

## HAZARDOUS DECOMPOSITION PRODUCTS

Poisonous oxides of nitrogen (gaseous)

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

# SECTION 4: SPILL AND DISPOSAL PROCEDURES

## SPILLS

Flush spill with plenty of water and neutralize with alkaline material such as soda ash, lime, etc. Provide adequate ventilation to eliminate oxides of nitrogen fumes and any carbon dioxide gas from use of soda ash or limestone. Alternatively use J.T.Baker's Acid Spill Cleanup Kit.

## DISPOSAL

Dilute and neutralize as above before disposal. If local environmental regulations permit, flush neutralized residue to sewer with plenty of water.

# SECTION 5: RESPIRATORY PROTECTION

## RESPIRATORY PROTECTION (specify type)

Use self-contained oxygen or clean air-supplied breathing apparatus.

VENTILATION	LOCAL Sufficient to eliminate all fumes	SPECIAL
	MECHANICAL (general)	OTHER

PROTECTIVE GLOVES Neoprene gloves	EYE PROTECTION Chemical safety goggles plus face shield
--------------------------------------	--

## OTHER PROTECTIVE EQUIPMENT

Neoprene aprons, neoprene safety shoes, and neoprene clothing as necessary to prevent skin contact

# SECTION 6: HANDLING AND STORAGE PRECAUTIONS

## STORAGE & HANDLING

Store in well-ventilated, properly drained site away from heat and out of sun. Isolate from incompatible materials.

# SECTION 7: ADDITIONAL INFORMATION

Nitric vapor and oxides of nitrogen are insidious, symptoms from inhalation may be delayed. Do not breathe these fumes.

Date issued:

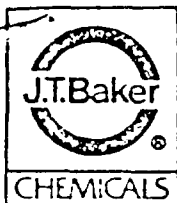
8/7/18

Approved by

*R. J. Lusk*  
Manager, Quality Assurance

Revision No. & Date Issued

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# MATERIAL SAFETY DATA SHEET

J. T. Baker Chemical Co., 222 Red School Lane, Phillipsburg, N.J. 08865

## SECTION II: IDENTIFICATION OF PRODUCT

CHEMICAL NAME Hydrochloric Acid	FORMULA HCl
SYNONYM OR CROSS REFERENCE Hydrogen Chloride Hydrochloride	CAS NO: 7647-01-0

## SECTION III: HAZARDOUS INGREDIENTS

MATERIAL	NATURE OF HAZARD
----------	------------------

## SECTION IV: PHYSICAL DATA

BOILING POINT About 110°C.	MELTING POINT
VAPOR PRESSURE 212 mm Hg at 20°C.	SPECIFIC GRAVITY 1.19
VAPOR DENSITY (AIR=1) 1.3	PERCENT VOLATILE BY VOLUME (%)
WATER SOLUBILITY Complete	EVAPORATION RATE (_____ = 1)

APPEARANCE  
Clear, colorless to light-yellow, fuming liquid; acrid odor.

## SECTION V: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (method used) None	FLAMMABLE LIMITS	Lower	Upper
FIRE EXTINGUISHING MEDIA Water, neutralize with chemically basic substances such as soda ash or slaked lime.			
SPECIAL FIRE-FIGHTING PROCEDURES			

UNUSUAL FIRE AND EXPLOSION HAZARD Highly corrosive to most metals with evolution of hydrogen gas, which is highly flammable when mixed with air.

## SECTION VI: HEALTH HAZARD

THRESHOLD LIMIT VALUE  
5 ppm (10 mg/M<sup>3</sup>) orl-rbt LD<sub>50</sub>: 900 mg/kg

HEALTH HAZARDS  
Causes severe burns. May be fatal if swallowed.

FIRST AID PROCEDURES Call a physician. In case of eye contact, flush with water for at least 15 minutes. For skin contact, flood with tap water, then water containing sodium bicarbonate. Do not give emetics. Give tap water, milk or milk of magnesia. Give whites of eggs beaten with water. Do not get in eyes, on skin or clothing. Do not breathe vapor.

**SECTION VI REACTIVITY DATA**

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATIBILITY (materials to avoid)

Reacts with metals to produce hydrogen gas. Iron and aluminum are corroded readily.

**HAZARDOUS DECOMPOSITION PRODUCTS**

HAZARDOUS

MAY OCCUR

CONDITIONS TO AVOID

POLYMERIZATION

WILL NOT OCCUR

X

**SECTION VII SPILL AND DISPOSAL PROCEDURES****SPILLS**

Cover with sodium carbonate or an equal mixture of soda ash and slaked lime. Add water if necessary to form slurry. Alternatively, for small spills, use J.T. Baker's Acid Spill Clean Up Kit (Product No. 4442); for large spills, use J.T. Baker's Neutrasorb<sup>®</sup> Acid Neutralizer (Product No. 4456).

**DISPOSAL**

Contact professional disposal service

**SECTION VIII PROTECTION INFORMATION**

RESPIRATORY PROTECTION (specify type)

Self-contained breathing apparatus

VENTILATION

LOCAL

SPECIAL

X

MECHANICAL (general)

OTHER

X

PROTECTIVE GLOVES

Rubber gloves

EYE PROTECTION

Safety glasses or goggles

OTHER PROTECTIVE EQUIPMENT

Approved working clothes. Have body shield available.

**SECTION IX HANDLING AND STORAGE PRECAUTIONS****STORAGE & HANDLING**

Keep in tightly closed container in a cool place. Loosen closure cautiously.

**SECTION X MISCELLANEOUS INFORMATION**

Do not get in eyes, on skin or clothing. Do not breathe vapor. Wash thoroughly after handling.

Date issued: \_\_\_\_\_

Approved by R. M. Mitchell  
Manager, Quality Assurance

Revision No. &amp; Date Issued: \_\_\_\_\_

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# MATERIAL SAFETY DATA SHEET

J. T. Baker Chemical Co., 222 Red School Lane, Phillipsburg, N.J. 08865

## SECTION I: IDENTIFICATION OF PRODUCT

CHEMICAL NAME Cupric Sulfate	FORMULA $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
SYNONYM OR CROSS REFERENCE Copper Sulfate Blue Vitrol	CAS NO: 7758-99-8

## SECTION II: HAZARDOUS INGREDIENTS

MATERIAL	NATURE OF HAZARD
----------	------------------

## SECTION III: PHYSICAL DATA

BOILING POINT	MELTING POINT
VAPOR PRESSURE	SPECIFIC GRAVITY 2.29
VAPOR DENSITY (AIR=1)	PERCENT VOLATILE BY VOLUME (%) Slowly efflorescent
WATER SOLUBILITY At 180° F. about 57.5% soluble	EVAPORATION RATE (_____ = 1)
APPEARANCE Blue crystals; no odor	

## SECTION IV: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (method used)	FLAMMABLE LIMITS	Lower	Upper
FIRE EXTINGUISHING MEDIA			
SPECIAL FIRE-FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARD			

## SECTION V: HEALTH HAZARD

THRESHOLD LIMIT VALUE LD <sub>50</sub> : owl-rabbit: 300 mg/kg
HEALTH HAZARDS Strong irritant to skin and mucous membranes.
FIRST AID PROCEDURES In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. The heat of hydration is so high that small quantities of water on monohydrate can generate enough heat to blister or scald. Call a physician.

CHEMICAL NAME

**SECTION VI REACTIVITY DATA**

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATABILITY (materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS

MAY OCCUR

CONDITIONS TO AVOID

POLYMERIZATION

WILL NOT OCCUR

X

**SECTION VII SPILL AND DISPOSAL PROCEDURES**

SPILLS

Carefully sweep up and remove. Flush spill area with plenty of water.

DISPOSAL

Treat with lime to precipitate basic copper salts insoluble in water. Dispose in accordance with local environmental regulations.

**SECTION VIII PROTECTION INFORMATION**

RESPIRATORY PROTECTION (specify type)

Dust respirator

VENTILATION

LOCAL

X

SPECIAL

MECHANICAL (general)

X

OTHER

PROTECTIVE GLOVES

Rubber gloves

EYE PROTECTION

Safety goggles

OTHER PROTECTIVE EQUIPMENT

Approved working clothes with long sleeves

**SECTION IX HANDLING AND STORAGE PRECAUTIONS**

STORAGE &amp; HANDLING

Keep in tightly closed container. Store in a dry place.

**SECTION X MISCELLANEOUS INFORMATION**

Avoid contact with eyes, skin or clothing.

Date issued: \_\_\_\_\_

Revision: \_\_\_\_\_

Approved by: R. M. Mitchell

Manager, Quality Assurance

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NEW TELEPHONE NUMBER AND ADDRESS:  
TELEPHONE NUMBER: (312) 388-4030  
LA FINE SCIENTIFIC COMPANY  
13636 WESTERN AV/PO BOX 780  
BLUE ISLAND IL 60406-0780  
Chemtrec # (800) 424-9300  
National Response Center # (800) 424-8802

Co.  
burg, N.J. 08865  
) 859-2151

# MATERIAL SAFETY DATA SHEET

P3973 -01  
Effective: 10/11/85

Phosphoric Acid

Page: 1  
Issued: 10/11/85

## SECTION I - PRODUCT IDENTIFICATION

Product Name: Phosphoric Acid  
Formula:  $H_3PO_4$   
Formula Wt: 98.00  
CAS No.: 07664-38-2  
NIOSH/RTECS No.: TB6300000  
Common Synonyms: ortho-Phosphoric Acid  
Product Codes: 0261,0266,0264,5372,0262,0260,0259,0265,0267

## PRECAUTIONARY LABELLING

BAKER SAF-T-DATA<sup>TM</sup> System

HEALTH	FLAMMABILITY	REACTIVITY	CONTACT
<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>
MODERATE	NONE	MODERATE	SEVERE

Laboratory Protective Equipment



Precautionary Label Statements

DANGER!  
CAUSES BURNS  
HARMFUL IF SWALLOWED

Do not get in eyes, on skin, on clothing.  
Avoid breathing vapor. Keep in tightly closed container. Use with adequate ventilation. Wash thoroughly after handling.

## SECTION II - HAZARDOUS COMPONENTS

Component	%	CAS No.
Phosphoric Acid	85-100	7664-38-2

## SECTION III - PHYSICAL DATA

Boiling Point:	158°C ( 316°F)	Vapor Pressure(mmHg):	2.2
Melting Point:	21°C ( 70°F)	Vapor Density(air=1):	3.4

Continued on Page: 2





# J. T. Baker Chemical Co.

222 Red School Lane Phillipsburg, N.J. 08865  
24-Hour Emergency Telephone -- (201) 859-2151

Chemtrec # (800) 424-9300  
National Response Center # (800) 424-8802

**MATERIAL  
SAFETY DATA  
SHEET**

P3973 -01

Phosphoric Acid

Page: 2

Effective: 10/11/85

Issued: 10/11/85

## SECTION III - PHYSICAL DATA (Continued)

Specific Gravity: 1.71  
(H<sub>2</sub>O=1)

Evaporation Rate: N/A  
(Butyl Acetate=1)

Solubility(H<sub>2</sub>O): Complete (in all proportions) & Volatiles by Volume: N/A

Appearance & Odor: Colorless, odorless, syrupy liquid.

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A

NEPA 704M Rating: 2-0-0

### Fire Extinguishing Media

Use water spray, carbon dioxide, dry chemical or ordinary foam.

### Special Fire-Fighting Procedures

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

### Usual Fire & Explosion Hazards

Gives off flammable vapors. Vapors may form explosive mixture with air.  
Closed containers exposed to heat may explode.

### Toxic Gases Produced

phosphorus oxide

## SECTION V - HEALTH HAZARD DATA

Threshold Limit Value (TLV/TWA): 1 mg/m<sup>3</sup> ( ppm)

Toxicity: LD<sub>50</sub> (oral-rat)(mg/kg) - 1530

LD<sub>50</sub> (skin-rabbit)(mg/kg) - 2740

### Effects of Overexposure

Contact with skin or eyes may cause severe irritation or burns.  
Inhalation of vapors may cause severe irritation of the respiratory system.

### Emergency and First Aid Procedures

If swallowed, do NOT induce vomiting. Give water, milk, or milk of magnesia.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Wash clothing before re-use.

Continued on Page: 3



# J. T. Baker Chemical Co.

222 Red School Lane Phillipsburg, N.J. 08865  
24-Hour Emergency Telephone -- (201) 859-2151

Chemtrec # (800) 424-9300  
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**MATERIAL  
SAFETY DATA  
SHEET**

P3973 -01

Phosphoric Acid

Page: 2

Effective: 10/11/85

Issued: 10/11/85

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Continued on Page: 3



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**MATERIAL  
SAFETY DATA  
SHEET**

P3973 -01

Phosphoric Acid

Page: 4

Effective: 10/11/85

Issued: 10/11/85

-----  
SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION (Continued)  
-----

DOMESTIC (D.O.T.)

Proper Shipping Name	Phosphoric acid
Hazard Class	Corrosive material (liquid)
UN/NA	UN1805
Labels	CORROSIVE
Reportable Quantity	5000 LBS.

INTERNATIONAL (I.M.O.)

Proper Shipping Name	Phosphoric acid
Hazard Class	8
UN/NA	UN1805
Labels	CORROSIVE

-----  
N/A = Not Applicable or Not Available  
-----

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LAYOUT DYE

**U.S. DEPARTMENT OF LABOR**  
Occupational Safety and Health Administration

Form Approved  
OSHA No. 64-R1287

No. 3

# MATERIAL SAFETY DATA SHEET

2/3/81-15

(100)

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME <b>DYKEM COMPANY</b>		EMERGENCY TELEPHONE NO. <b>(314)423-0100</b>
ADDRESS <b>8501 Delport Drive, St. Louis, Missouri 63114</b>		
CHEMICAL NAME AND SYNONYMS <b>Does not apply</b>	TRADE NAME AND SYNONYMS <b>DYKEM STEEL BLUE DX-100</b> ✓	
CHEMICAL FAMILY <b>Specialty Lacquers</b>	FORMULA <b>Does not apply</b>	

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES & SOLVENTS	CAS REGISTRY NO.	%	TLV (Units)
Dyes Dyes (Methyl Violet) ✓	8004-87-3	1	---
Solvents Butyl Acetate ✓	123-86-4	33	150
Solvents Denatured Alcohol	64-17-5	57	1000
Solvents Butyl Alcohol	71-36-3	4	100
Vehicle Wet Nitrocellulose	9004-67-63.0	5	---

"DYKEM" is the Registered Trade-mark of a line of Proprietary Products used by Industry since 1920. Never any harm to any of our employees who handle daily large volumes of raw materials and finished products. Containers are labeled with Caution Notice regarding flammability and use with adequate ventilation.

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.) <b>160°F</b>	SPECIFIC GRAVITY (H <sub>2</sub> O=1) <b>.86</b>
VAPOR PRESSURE (mm Hg.) <b>36mm@20°C</b>	PERCENT VOLATILE BY VOLUME (N) <b>90</b>
VAPOR DENSITY (AIR=1) <b>Heavier than air</b>	EVAPORATION RATE <b>(Faster than Butyl Acetate)</b>
SOLUBILITY IN WATER <b>Partially</b>	
APPEARANCE AND ODOR <b>Intense color, mild odor</b>	

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (MMINE USED) <b>61°F TOC</b>	FLAMMABLE LIMITS <b>1.4 to 11.2</b>	LC <sub>50</sub>	LC <sub>50</sub>
EXTINGUISHING MEDIA <b>Carbon Dioxide, Regular Foam, Dry Chemical</b>			
SPECIAL FIRE FIGHTING PROCEDURES <b>Wear self-contained breathing apparatus in enclosed areas.</b>			
UNUSUAL FIRE AND EXPLOSION HAZARDS <b>Vapors are heavier than air and may travel along ground, or may be moved by ventilation and ignited by sparks, flame or other</b>			

ignition sources.  
PAGE (1)

(Continued on reverse side)

Form OSHA-20  
Rev. May 78

PROPER SHIPPING NAME: DOT: **PAINT, FLAMMABLE LIQUID in Quart containers or larger; CONSUMER COMMODITY ORM-D for Spray cans and smaller than quart containers**

HAZARD CLASS: **FLAMMABLE LIQUID**I. D. NUMBER: **UN-1263**

**SECTION V - HEALTH HAZARD DATA**

THRESHOLD LIMIT VALUE

830 (Estimated)

EFFECTS OF OVEREXPOSURE

Irritation of nose and throat. Reddness and irritation of eyes. Excessive breathing of vapors can cause nausea and respiratory irritation.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed, contact local Poison Control Center or Physician immediately. Flush eye or skin contact with large amounts of water. If exposed to excessive vapors, remove to fresh air.

**SECTION VI - REACTIVITY DATA**

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

None

INCOMPATIBILITY (Materials to avoid)

Strong oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide or carbon dioxide

HAZARDOUS POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

X

None

**SECTION VII - SPILL OR LEAK PROCEDURES**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb in waste material that can be burned. Remove stain (color) with DYKEM REMOVER & THINNER 138.

WASTE DISPOSAL METHOD

No waste normally, incinerate or normal disposal for flammables, in accordance with local, state and federal regulations.

**SECTION VIII - SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION (Specify type)

None needed

VENTILATION

LOCAL EXHAUST

Preferred (ordinary)

SPECIAL

None

MECHANICAL (General)

Acceptable

OTHER

None

PROTECTIVE GLOVES

None needed with normal use

EYE PROTECTION

None needed under normal conditions

OTHER PROTECTIVE EQUIPMENT

None needed

**SECTION IX - SPECIAL PRECAUTIONS**

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from heat and flames. Use with adequate ventilation.

OTHER PRECAUTIONS

None

OSHA 8877

AGE (2)

SPS 884-1B

Information furnished by: DYKEM COMPANY  
R. Belleville  
(314)423-0100

DATE:

AUG 23 1988

HAZARD RATING

4 - EXTREME  
3 - HIGH  
2 - MODERATE  
1 - SLIGHT  
0 - INsignificant

TOXICITY  
HEALTH

Form OSHA-20

Rev. May 73

# MATERIAL SAFETY DATA SHEET



## LIQUID CARBONIC INDUSTRIAL/MEDICAL CORPORATION

135 SOUTH LA SALLE STREET • CHICAGO, ILLINOIS 60603-4282  
PHONE (312) 855-2500

J. L. CLARK ATLAS TUBE CO.  
DOWNERS GROVE, ILL.

April 1986

Emergency Phone Numbers: (312) 855-2500; CHEMTREC (800) 424-9300

### SECTION I—PRODUCT IDENTIFICATION

CHEMICAL NAME: Acetylene  
COMMON NAME AND SYNONYMS: Acetylene, Ethyne, Ethine  
CHEMICAL FAMILY: Alkynes FORMULA:  $C_2H_2$

### SECTION II—HAZARDOUS INGREDIENTS

MATERIAL	VOLUME %	CAS NO.	1985-6 ACGIH TLV UNITS
Acetylene	100%	74-86-2	Simple asphyxiant—No TLV

### SECTION III—PHYSICAL DATA

BOILING POINT (°F.)	-112°F	SPECIFIC GRAVITY ( $H_2O=1$ )	0.613 @ B. P.
VAPOR PRESSURE (mmHg.)	@ -112°F 760	% VOLATILE BY VOLUME	100%
VAPOR DENSITY (AIR=1)	32°F 0.907	EVAPORATION RATE (BUTYL ACETATE=1)	Rapid
SOLUBILITY IN WATER	Slight		
APPEARANCE AND ODOR	Colorless with garlic like odor		

### SECTION IV—FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED) -18°C (C.C.)  
FLAMMABLE LIMITS % BY VOLUME IN AIR LEL 2.5 UEL 81  
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, Halon, water

SPECIAL FIRE FIGHTING PROCEDURES: Stop gas flow and fight fire conventionally. Fire fighters should be cognizant of extreme fire and explosion hazards and fight fire from safe distance. Keep containers cool with water spray. Use self contained breathing apparatus. Fires which have been extinguished without stopping flow of gas can easily re-ignite or explode.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Acetylene decomposes above 15 psig pressure if undissolved in acetone. Cylinder safety fuse melts at 212°F and will release gas. Acetylene can decompose violently when heated or shocked. Ref: CGA bulletin SG-4 "Handling Acetylene Cylinders in Fire Situations."

### SECTION V—HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: No TLV Established - Workplace air must have over 18%  $O_2$  by volume at atmospheric pressure.  
EFFECTS OF OVEREXPOSURE: Headaches, dizziness, shortness of breath, unconsciousness, death. Symptoms of anoxia only occur when gas is in flammable range and has not ignited.  
EMERGENCY AND FIRST AID PROCEDURES: Remove to fresh air. Do not enter areas within the flammability range (over 2.5%) because of immediate fire and explosion hazard. Use an explosimeter for acetylene to measure concentration in air. Stop gas supply if possible and keep containers cool with water spray. Gas has an anesthetic action. Pure Acetylene can be inhaled in high concentrations without chronic harmful effects. Acetylene is a simple asphyxiant which can displace oxygen in the air to asphyxiating levels. If inhaled give oxygen, or if unconscious give artificial respiration. Obtain prompt medical assistance. Keep warm and at rest.  
ROUTE(S) OF ENTRY: INHALATION? Yes SKIN? INGESTION?  
CARCINOGENICITY: NTP? No IARC MONOGRAPHS? No OSHA? No

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#### SECTION VI—REACTIVITY DATA

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STABILITY: UNSTABLE (X) STABLE ( )

CONDITIONS TO AVOID: Undissolved gas dissociates above 15 psig. Can decompose violently when heated or shocked without oxygen or air.

INCOMPATABILITY (MATERIALS TO AVOID): Oxidizers, halogens, copper, silver, mercury

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon and hydrogen

HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WON'T OCCUR (X)

CONDITIONS TO AVOID: N/A

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#### SECTION VII—SPILL OR LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from affected area. Use appropriate protective equipment. Eliminate ignition sources. Shut off flow of gas if possible. Provide maximum explosion proof ventilation.

WASTE DISPOSAL METHOD: Move cylinders to a remote outdoor area. Burn off gas or allow to slowly diffuse into atmosphere. Follow Federal, state, or local disposal regulations.

---

#### SECTION VIII—SPECIAL PROTECTION INFORMATION

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RESPIRATORY PROTECTION: Self-contained breathing apparatus

VENTILATION: LOCAL EXHAUST (X) Provide local ventilation to keep acetylene concentration in air below 2500 ppm.

MECHANICAL (GENERAL) (X) Forced ventilation to prevent acetylene concentration from reaching up to flammable range.

PROTECTIVE GLOVES: Leather

EYE PROTECTION: Safety goggles

OTHER PROTECTIVE EQUIPMENT: Safety shoes, acetylene monitor and alarm

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#### SECTION IX—SPECIAL PRECAUTIONS

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Protect cylinders from physical damage. Store in cool, dry, and well ventilated area. Electrical equipment should be explosion proof and non-sparking. All lines and equipment should be electrically grounded. Post "No Smoking or Open Flame" signs in storage and use areas. Store away from oxidizer and corrosive gases. Store cylinders in upright position, secured to prevent falling over. There should be no sources of ignition in storage or use area. Use a check valve or trap in cylinder discharge to prevent hazardous back-flow.

OTHER PRECAUTIONS: To avoid hazardous acetylene dissociation, do not allow the free gas to exceed 15 psig pressure @ 70°F. Follow withdrawal rate maximum so that solvent is not withdrawn with gas. Use only DOT or ASME coded containers. Container must not be recharged except by or with consent of Liquid Carbonic. Reference OGA Bulletins SB-2 "Oxygen Deficient Atmospheres," SB-4 "Handling Acetylene Cylinders in Fire Situations"; OGA Pamphlets G-1 "Acetylene" and P-1 "Safe Handling of Compressed Gases in Containers."

No guaranty is made as to the accuracy of any data or statement contained herein. While this material is furnished in good faith, NO WARRANTY EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE IS MADE. This material is offered only for your consideration, investigation and verification and Liquid Carbonic shall not in any event be liable for special, incidental or consequential damages in connection with its publication.

# MATERIAL SAFETY DATA SHEET



## LIQUID CARBONIC

INDUSTRIAL/MEDICAL CORPORATION

135 SOUTH LA SALLE STREET • CHICAGO, ILLINOIS 60603-4282  
PHONE (312) 855-2500

APR 25 1986  
L. CLARK, ATLAS TUBE DIV  
DOWNERS GROVE, ILL.

April 1986

Emergency Phone Numbers: (312) 855-2500; CHEMTREC (800) 424-9300

### SECTION I—PRODUCT IDENTIFICATION

CHEMICAL NAME: Oxygen  
COMMON NAME AND SYNONYMS: Gaseous Oxygen, GOX, Oxygen Gas  
CHEMICAL FAMILY: Oxidizer FORMULA: O<sub>2</sub>

### SECTION II—HAZARDOUS INGREDIENTS

MATERIAL	VOLUME %	CAS NO.	1985-6 ACGIH TLV UNITS
Oxygen	99.5	7782-44-7	None

### SECTION III—PHYSICAL DATA

BOILING POINT (°F.)	-297	SPECIFIC GRAVITY (H <sub>2</sub> O)	1.14 @ B.P.
VAPOR PRESSURE (mmHg.)	Above Critical Temp-181.4	% VOLATILE BY VOLUME	100%
VAPOR DENSITY (AIR=1)	1.105	EVAPORATION RATE	N/A
SOLUBILITY IN WATER	Slightly	(BUTYL ACETATE=1)	
APPEARANCE AND ODOR	Colorless, odorless Gas		

### SECTION IV—FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	N/A	FLAMMABLE LIMITS	LEL	UEL
				N/A

EXTINGUISHING MEDIA: Large quantities of water, carbon dioxide less effective

SPECIAL FIRE FIGHTING PROCEDURES: Remove source of Oxygen which aids combustion. Keep storage equipment cool. Fight fire according to material involved.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Strong oxidizer, vigorously reacts with hydrocarbons and organic materials. Fire exposed cylinders could rupture violently if cylinder safety devices fail to relieve pressure.

### SECTION V—HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None specified.

- EFFECTS OF OVEREXPOSURE: Breathing high concentrations (over 75% by volume) causes symptoms of hyperoxia including cramps, nausea, dizziness, hypotermia, anbylopia, respiratory difficulties, fainting, convulsions capable of leading to death.

EMERGENCY AND FIRST AID PROCEDURES: Advise physician of hyperoxia. Prompt medical attention is mandatory in cases of over exposure. Remove to area with fresh air and assist respiration.

ROUTE(S) OF ENTRY: INHALATION? Yes SKIN? Yes INGESTION?  
CARCINOGENICITY: NTP? No IARC MONOGRAPHS? No OSHA? No



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#### SECTION VI—REACTIVITY DATA

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STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid hydrocarbons and organic materials

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WON'T OCCUR (X)

CONDITIONS TO AVOID: N/A

---

#### SECTION VII—SPILL OR LEAK PROCEDURES

---

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Attempt to stop source of release. Evacuate all personnel from affected area.

Use appropriate protective equipment. Remove sources of heat or ignition.

Ventilate area.

WASTE DISPOSAL METHOD:

No disposal problem, gas will diffuse into atmosphere.

---

#### SECTION VIII—SPECIAL PROTECTION INFORMATION

---

RESPIRATORY PROTECTION: Not required

VENTILATION: LOCAL EXHAUST (X) Prevent O<sub>2</sub> concentration over 25%  
MECHANICAL (GENERAL) ( )

PROTECTIVE GLOVES: Cotton or leather. · EYE PROTECTION: Safety glasses or goggles

OTHER PROTECTIVE EQUIPMENT: Safety shoes and safety shower; Low or high oxygen concentration alarm less than 18% or over 25% respectively, where necessary.

---

#### SECTION IX—SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Do not store near combustible materials or in hot locations. Protect from physical damage. Store in clean, cool, well ventilated locations. Oxygen in cylinders is a high pressure oxidizing gas, which vigorously accelerates combustion. Keep oil, grease, and hydrocarbons away. Open oxygen valves slowly.

OTHER PRECAUTIONS:

Oxygen equipment must be cleaned and degreased for oxygen service. Use only DOT and ASME coded storage containers. Refer to Bulletin SB-2, CGA pamphlet G.4.1 and P-14.

SB-2 — "Oxygen Deficient Atmospheres"

G-4.1 — "Cleaning Equipment for Oxygen Service"

P-14 — "Accident Prevention Oxygen-Rich and  
Oxygen-Deficient Atmospheres"

Use a check valve or trap in the oxygen cylinder discharge to prevent hazardous backflow. Cylinders must not be recharged except by or with consent of Liquid Carbonic.

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# MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY  
343 State Street  
Rochester, New York 14650

DATE: 09/20/89  
PO NBR: 25040  
ACCT: 01822501  
INDEX: 05892620251  
CAT NO: EK1189414  
SHEET: R-0325.700

For Emergency Health, Safety, and Environmental Information, call 716-722-5151  
For all other purposes, call 800-225-5352, in New York State call 716-458-4014

Date of Preparation: 01/26/87

Kodak Accession Number: 906966

## SECTION I. IDENTIFICATION

- Product Name: Squalene
- Synonym(s): 2,6,10,15,19,23-Hexamethyl-2,6,10,14,18,22-tetracosahexaene
- Formula: C30 H50
- CAT No(s): 118 9406; 118 9414; 118 9422; 118 9430; 118 9448
- Chem. No(s): 06966
- Kodak's Internal Hazard Rating Codes: R: 1 S: 1 F: 1 C: 1

## SECTION II. PRODUCT AND COMPONENT HAZARD DATA

COMPONENT(S):	Percent	ACGIH TLV(R)	CAS Reg. No.
Squalene	ca. 100	---	111-02-4

## SECTION III. PHYSICAL DATA

- Appearance and Odor: Colorless liquid; slight fish odor
- Boiling Point: 275 C (527 F) @ 15 mmHg
- Vapor Pressure: 2 mmHg at 240 C (464 F)
- Evaporation Rate (n-butyl acetate = 1): Negligible
- Volatile Fraction by Weight: Negligible
- Specific Gravity (Water = 1): 0.86
- Solubility in Water (by Weight): Negligible

## SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: Greater than 110 C (230 F), Setaflash closed cup
- Extinguishing Media: Water spray; Dry chemical; Carbon dioxide; Foam
- Special Fire Fighting Procedures: None
- Unusual Fire and Explosion Hazards: None

## SECTION V. REACTIVITY DATA

- Stability: Stable, however, material can decompose above 325 C. Avoid temperatures above 225 C.
- Incompatibility: Strong oxidizers
- Hazardous Decomposition Products: Combustion will produce carbon dioxide and probably carbon monoxide.
- Hazardous Polymerization: Will not occur.

R-0325.700A

86-8050

SQUALENE

=====

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. EXPOSURE LIMITS: Not established.

B. EXPOSURE EFFECTS:

Inhalation: Low hazard for usual industrial handling.

Skin: Low hazard for usual industrial handling.

Eye: No specific hazard known. Contact may cause transient irritation.

Ingestion: Expected to be a low ingestion hazard.

C. FIRST AID:

Inhalation: Remove to fresh air following overexposure.

Skin: Wash after each contact.

Eye: Flush eyes with plenty of water.

Ingestion: Drink 1-2 glasses of water. Seek medical attention.

=====

SECTION VII. VENTILATION AND PERSONAL PROTECTION

A. VENTILATION AND RESPIRATORY PROTECTION:

Good ventilation should be sufficient. Supplementary ventilation or respiratory protection may be needed in special circumstances.

B. SKIN AND EYE PROTECTION:

Safety glasses recommended in industrial operations involving chemicals.

If prolonged or repeated skin contact is necessary, gloves or other protection may be required.

=====

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep from contact with oxidizing materials.

=====

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Absorb material in vermiculite or other suitable absorbent and place in impervious container.

Dispose by incineration or contract with licensed chemical waste disposal agency. Discharge, treatment, or disposal may be subject to federal, state or local laws.

=====

For transportation information regarding this product, please phone the Eastman Kodak Distribution Center nearest you: Rochester, NY (716) 254-1300; Oak Brook, IL (312) 654-5300; Chamblee, GA (404) 455-0123; Dallas, TX (214) 241-1611; Whittier, CA (213) 945-1255; Honolulu, HI (808) 833-1661.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

=====

R-0325.700A

\*\*\* END OF DOCUMENT \*\*\*

SHEET NBR: R-0325.700 CAT NBR: EK1189414

86-8050

2906966\*

\*\*\* END OF DOCUMENT \*\*\*

VIKING CHEMICAL COMPANY  
1827 - 18th Ave.  
P.O. Box 1595  
Rockford, IL 61110

Bill WHITCHER

(815) 397-0500

M A T E R I A L   S A F E T Y   D A T A   S H E E T

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME: Freon TF

CHEMICAL NAME: Halogenated Hydrocarbon

PRODUCT APPEARANCE/ODOR: Clear colorless liquid, mild odor

EMERGENCY TELEPHONE NUMBER:

CHEMTREC - 800-424-9300  
VIKING CHEMICAL CO - 815-397-0500

COMPONENTS AND HAZARD INFORMATION

Hazard Components (Specific Chemical Identity) (Common name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended
---	----------	-----------	-----------------------------

1,1,2-Trichloro	1000 ppm	1000 ppm	
1,2,2-Trifluorethane	1000 ppm	1000 ppm	

HMIS (Hazardous Materials Identification System)

Health	Flammability	Reactivity
N.D.	N.D.	N.D.

C. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides lifting upper and lower lids occasionally. If irritation develops, call a physician.

**SKIN CONTACT**

In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

**INHALATION**

If affected, remove individual to fresh air. If breathing is difficult administer oxygen. If breathing has stopped give artificial respiration. Keep person warm, quiet and get medical attention. Do not give stimulants. Epinephrine or ephedrine may adversely affect the heart with a fatal result.

**INGESTION**

If ingested, drink large amounts of water. INDUCE VOMITING, and call a physician immediately.

**D. FIRE AND EXPLOSION HAZARD INFORMATION**

=====

**FLASH POINT (minimum)** N.A.

**FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)**

Estimated values: Lower Flammable Limit: N.A.  
Upper Flammable Limit: N.A.

**(NFPA) NATIONAL FIRE PROTECTION ASSOCIATION - HAZARD INFORMATION**

Health	Flammability	Reactivity
N.D.	N.D.	N.D.

**HANDLING PRECAUTIONS**

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

**EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES**

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire or circumstances related to the situation.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak.

Water spray may be used to flush spills away from exposures. Minimize breathing gases; vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise specified.

#### DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fume, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

#### 'EMPTY' CONTAINER WARNING

'Empty' containers retain residue (liquid and/or vapor) and can be dangerous. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other governmental and industrial contemplated operations. All hazard precautions given in the data sheet must be observed.

#### E. HEALTH AND HAZARD INFORMATION

=====

##### EFFECTS OF OVEREXPOSURE (signs and symptoms of exposure):

##### EYE CONTACT

May cause irritation.

##### SKIN CONTACT

Prolonged or repeated skin contact tends to remove skin oils which could lead to irritation and dermatitis.

##### SKIN ABSORPTION

Prolonged or repeated skin contact can cause moderate irritation, defatting and dermatitis.

##### INHALATION

High vapor concentrations (> 1000 ppm) may be irritating to the respiratory tract and could cause headaches, dizziness or other central nervous system effects.

##### INGESTION

May cause gastrointestinal irritation and large amounts may cause serious harm.

## F. PHYSICAL DATA

=====

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE > 117 deg. F.  
(IBP Approximately by  
ASTM D 2887)

VAPOR PRESSURE 334.00 mmHg  
(@ 77 deg. F.)

SPECIFIC GRAVITY 1.565  
(15.6 C / 15.6 C)

VAPOR DENSITY 6.5  
(Air = 1)

EVAPORATION RATE .10  
(Carbon Tetra-Cl = 1)

PERCENT VOLATILE 100  
BY VOLUME

## G. REACTIVITY

=====

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with alkali metals, reactive metals such as aluminum and magnesium.

## H. SPILL OR LEAK PROCEDURES

=====

## STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize skin contact. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Keep product out of sewers and water-cources by diking or impounding. Advise authorities if product has entered or may enter sewers, watercources, or extensive land areas. Assure conformity with applicable governmental regulations.

**I. PROTECTION AND PRECAUTIONS**

=====

**VENTILATION**

Use local exhaust to capture vapor, mists or fumes. If necessary, provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

**RESPIRATORY PROTECTION**

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

**PROTECTIVE GLOVES**

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

**EYE PROTECTION**

Use splash goggles or face shield when eye contact may occur.

**OTHER PROTECTIVE EQUIPMENT**

Use chemical-resistant apron or other impervious clothing, if needed to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

**WORK PRACTICES / ENGINEERING CONTROLS**

Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

**PERSONAL HYGIENE**

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse. Cleanse skin thoroughly after contact, before breaks and meals and at end of work period.



J. TRANSPORTATION INFORMATION

=====

TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER

Not applicable.

K. ADDITIONAL INFORMATION

=====

None

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH  
BUT NO WARRANTY, EXPRESSED OR IMPLIED IS MADE

\*prepared date: 6/23/87

VSR

N.A. (not applicable)

N.D. (not determined)

PRODUCTION METALS & LUBE  
09/02/97

MANUFACTURER	DATE	DESCRIPTION
ALCAN ALUMINUM	11/01/85	1170 ALLOY SLUGS
CHEMISCHE WERKE	08/14/86	ZINC BEHENATE
ABRIL INSUTRIAL WAX	05/17/95	ABRIL WAX 10DS
ABRIL INDUSTRIAL WAX	05/17/95	COSMIC WAX 84
WITCO	06/01/92	ZINC STEARATE USP

# Material Safety Data Sheet

Product Name  
ALCAN ALUMINUM METAL  
1XXX series alloy  
Date  
November 1985



## Identification

Manufacturer's name & address:

Alcan Aluminum Corporation  
100 Erieview Plaza  
Cleveland, OH 44114

Telephone/Business:

216/523-6800

Emergency: 315/349-0121 (Oswego, NY)  
812/466-2241 (Terre Haute, IN)  
502/521-7811 (Seabree, KY)

Product name & synonyms:

Alcan Aluminum Metal, 1XXX series alloys

## Ingredients

Material or component:

CAS  
Number

%

Threshold  
limit value

Aluminum (Al)

7429-90-5

99.0 - 99.99

10 mg/m<sup>3</sup> TWA ACGIH

20 mg/m<sup>3</sup> STEL ACGIH

Chemical Listed as

NTP

YES

NO

Carcinogen or potential

IARC

X

Carcinogen:

OSHA

X

## Chemical & Physical Properties

Boiling point:

N/A

Melting point:

482 - 660° C

depending on alloy Solubility in water: N/A

% volatile (vol):

N/A

Specific gravity (water = 1): 2.5 - 2.9

Vapor pressure (mmHg): N/A

Evaporation rate:

N/A

pH:

N/A

Appearance and odor:

Grey to silvery metallic solid; no odor.

Other:

N/A

---

## Fire & Explosion Hazards

---

Flash point (method):

N/A

Autoignition temp:

N/A

Flammable limits (%):

Lower: N/A Upper: N/A

Extinguishing media:

Not a fire hazard except in finely divided form. In case of an aluminum fire, use a class D dry powder extinguisher or dry sand. Do not use water or halogenated extinguishing media.

Special fire fighting procedures:

Do not use water or halogenated extinguishing media.

Unusual fire &amp; explosion hazards:

Molten aluminum may explode upon contact with water. Finely divided aluminum may explode when mixed with halogen acids, halogenated solvents, or ammonium nitrate. Finely divided aluminum reacts with halogen acids, water, and sodium hydroxide to produce hydrogen gas.

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## Health Effects

---

Aluminum dusts are considered nuisance particulates, which have little adverse effect on lungs and do not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Aluminum fumes generated in melting or welding are considered to be a low health risk.

Skin contact: N/A

Eye contact: Aluminum dust may cause abrasions.

Ingestion: N/A

Supplemental information: MIG welding or plasma arc cutting of aluminum alloys can generate ozone, nitric oxides, and ultraviolet radiation. Ozone overexposure may result in mucous membrane irritation, as well as other pulmonary discomforts.

---

## First Aid Procedures

---

Inhalation: In case of discomfort, move to a ventilated area. If discomfort persists, seek medical attention.

Skin contact: N/A

Eye contact: In case of discomfort, flush with water and if irritation persists, seek medical attention.

Ingestion: N/A

---

## Reactivity

Product corrosive  
Yes ☐ No ☒

Stability  
Unstable ☐ Stable ☒

Hazardous polymerization  
May occur ☐ Will not occur ☒

Conditions and materials to avoid:

Refer to page four (4)

Hazardous decomposition products:

N/A

---

## Spills, Leaks, Handling & Storage

Spill & leak procedures:

N/A

Waste disposal method:

Recycle. Finely divided aluminum may be reactive and its hazard characteristics should be determined prior to disposal.

(Disposer must comply with Federal, state or local waste disposal laws)

Handling and storage methods:

N/A

---

## Special Precautions

Ventilation requirements If ventilation is to be used to convey finely divided aluminum generated by grinding, sawing, or etc., special ventilation provisions may be required. See National Fire Protection Association Codes, NFPA 65 and 651.

Respiratory protection: (Use NIOSH/MSHA approved respirators)

Appropriate respiratory protection for concentrations above the exposure limits.

Protective clothing: Molten metal handling requires the use of both secondary and primary personal protective equipment, refer to the Aluminum Assoc.'s Guideline, see below.

Additional protective measures: Handling molten aluminum presents a special hazard. For more information on molten aluminum, request a copy of Guidelines for Handling Molten Aluminum from the Aluminum Assoc., 818 Connecticut Ave., N.W., Washington, D.C. 20006

The information in this MSDS was obtained from sources which we believe are reliable but cannot guarantee. Additionally, your use of this information is beyond our control

and may be beyond our knowledge. Therefore, the information is provided without any representation or warranty, express or implied.

---

**Additional Information**

---

Ingredients listed by specific alloy for 1XXX series

<u>1XXX Series</u>	<u>Aluminum Minimum %</u>	<u>1XXX Series</u>	<u>Aluminum Minimum %</u>
1025	99.40	1100	99.00
1030	99.30	1200	99.00
1035	99.35	1230	99.30
1040	99.40	1135	99.35
1045	99.45	1235	99.35
1050	99.50	1435	99.35
1055	99.55	1145	99.45
1060	99.60	1345	99.45
1065	99.65	1250	99.50
1070	99.70	1350	99.50
1075	99.75	1170	99.70
1080	99.80	1175	99.75
1085	99.85	1180	99.80
1090	99.90	1185	99.85
1094	99.90	1285	99.85
1095	99.95	1188	99.88
		1199	99.99
		1109	99.00

Refer to packing list accompanying shipment of product for certificate of analysis for more detailed chemical composition.

Conditions and materials to avoid:

Aluminum can generate explosive mixtures of hydrogen in the presence of halogen acids or sodium hydroxide. Finely divided aluminum can form explosive mixtures with bromates, iodates, and ammonium nitrate. Aluminum scrap must be thoroughly dried prior to remelting. Finely divided aluminum can thermite in the presence of oxides of copper, lead, or iron.

Hot aluminum does not exhibit any warning color changes, therefore, caution needs to be exercised if the metal could be hot.

SECTION I

MANUFACTURER'S NAME CHEMISCHE WERKE MUENCHEN OTTO BAERLOCHER GMBH		DATE 14.08.86
STREET ADDRESS RIESSTRASSE 16		CITY, STATE, ZIP 8000 MUENCHEN 50 FRG
PRODUCT NAME Zink Soap	MANUFACTURER'S CODE I.D. 0102 4103	TRADE NAME ZINKBEHENAT
		EMERGENCY TEL. NO. 089/14881

SECTION II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	PPM	TLV mg/m <sup>3</sup>	LEL %	VAPOR PRESSURE mm Hg @ 68°F
N/A					

SECTION III — PHYSICAL DATA

BOILING RANGE N/A (M.P. approx. 120°C)				
VAPOR DENSITY	EVAPORATION RATE	% VOLATILE BY VOLUME	WEIGHT kg/l	SPECIFIC GRAVITY
<input type="checkbox"/> HEAVIER <input type="checkbox"/> LIGHTER THAN AIR	<input type="checkbox"/> FASTER <input type="checkbox"/> SLOWER THAN ETHER			

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA	FLASH POINT	LEL
<input type="checkbox"/> WATER-FOAM <input checked="" type="checkbox"/> FOAM <input type="checkbox"/> OTHER Do not use water <input checked="" type="checkbox"/> CARBON DIOXIDE <input checked="" type="checkbox"/> DRY CHEMICAL		
UNUSUAL FIRE AND EXPLOSION HAZARDS Potential dust explosion; for dust explosibility see factory insurance association publication: "Dust explosion analysis and control".		
SPECIAL FIRE FIGHTING PROCEDURES Do not use water: Burning material will float on water. Propelled media may create clouds of dust.		

SECTION V — REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
<input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	N/A
INCOMPATIBILITY (MATERIALS TO AVOID)	
N/A	
HAZARDOUS DECOMPOSITION PRODUCTS	
N/A	
HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
<input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR	N/A

N/A - NOT APPLICABLE

LD<sub>50</sub> oral rat: > 2000 mg/kg

#### EMERGENCY AND FIRST AID PROCEDURES

N/A

### SECTION VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove mechanically

WASTE DISPOSAL METHOD

May be incinerated or disposed in landfill.

### SECTION VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Not Advisable

VENTILATION

Not Necessary

PROTECTIVE GLOVES

Rubber

EYE PROTECTION

Goggles

OTHER PROTECTIVE EQUIPMENT

N/A

### SECTION IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid dusting conditions.

Observe local regulations on waste-water have to be observed.

N/A - NOT APPLICABLE

While the information and recommendations set forth are believed to be accurate as of the date hereof, Baerlocher Muenchen makes no warranty with respect thereto and disclaims all liability from reliance or action based thereon. Because of the nature of the product, user assumes all risk with respect to it.

PH





## Abril Industrial Waxes Limited

STURMI WAY · VILLAGE FARM INDUSTRIAL ESTATE · PYLE  
MID GLAMORGAN · UNITED KINGDOM CF33 6NU  
Tel: (01656) 744362 Fax: (01656) 742471



### MATERIAL SAFETY DATA SHEET

Version No 1 rev/1

MSDS AWCOS84/e

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17 May 1995

#### I IDENTIFICATION OF SUBSTANCE.

Product Name: Cosmic Wax 84.

Product Type: Synthetic Amide Wax.

Attn: Jim Klotz

NEW MSDS

#### II COMPOSITION INFORMATION ON INGREDIENTS.

Fatty bis amide.

#### III HAZARD IDENTIFICATION.

Physical and Environmental.

It is considered to be ultimately biodegradable. No metallic content of any description.

Adverse Human Health Effects.

This material is not a regulated substance and is not known to be a carcinogen.

#### IV. FIRST AID MEASURES.

Inhalation. In some cases it can cause a reversible irritation of the respiratory system. If a large exposure occurs remove the patient to fresh air. If further symptoms develop seek medical advice.

Skin Contact. Does not cause irritation. Wash clean with soap and water.

Eye Contact. Flush thoroughly with eye wash solution or water for about 10 minutes.

Ingestion. Wash the mouth clean with plenty of water, do not induce vomiting. Do not administer anything to an unconscious person. Seek medical attention, take data sheet with you if possible.



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17 May 1995

### V. ACCIDENTAL RELEASE MEASURES.

- Methods for Cleaning Up. Use vacuum to clean up any released product. Material is completely organic in character and can be safely disposed of to local authority tip. It can also be incinerated safely.
- Personal Precautions. Dust masks are advisable.
- Environmental Precautions. No toxic licence is required for this product. It is classed as non-hazardous.

### VI. FIRE FIGHTING MEASURES.

- Special Protective Equipment. Oxides of carbon and nitrogen are produced in a fire situation, so it is advisable that fire fighters use self contained breathing apparatus and suitable protective clothing.
- Suitable Extinguishing Media. Foam, CO<sub>2</sub>, water-spray, mist or fog. Do not use water jet type extinguishers.
- Special Exposure Hazards. Fire fighters to be aware that this product will in a fire situation behave as an "oil" type fire and can be spread very easily by the wrong type of fire fighting technique.
- Potential for Explosion. There is an associated dust explosion hazard, with powdered grades of product.  
However the lump product has very little potential for explosion because of the limited amount of powder present, however the powder product has a much greater potential for explosion. Avoid, generating dust clouds, as much as possible.

### VII. EXPOSURE CONTROLS/PERSONAL PROTECTION.

- Hand Protection. Gloves.
- Eye Protection. Chemical glasses/goggles.
- Skin Protection. General purpose overalls.
- Respiratory Protection. Nuisance dust mask.



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### VIII. HANDLING AND STORAGE.

**Handling.** Avoid dust development as much as possible, in the event of respiratory problems developing or an allergenic reaction avoid dust altogether. Comply with all H&S requirements.

This product, in the powder form can develop an electrostatic charge; use earthing leads where appropriate, also the use of antistatic clothing and footwear can be of benefit.

Isolate from heat, sparks, sparking tools and open flames. No smoking, eating or drinking in the vicinity of the point of use of the powder.

Avoid cross contamination. Always wash face and hands after exposure to the dust, and prior to eating smoking or drinking.

**Storage.** Store in a cool, dry, well lit and ventilated place away from extremes of temperature, and out of direct sunlight, avoid damp or wet conditions, this will tend to deteriorate the packaging. Do not store outside.

Store the product on a pallet, this keeps the product off the ground and away from any spills of liquid. Always reseal the container after use. This helps to prevent cross contamination. The maximum temperature of storage is 30°C and the minimum is 5°C.

### IX. PHYSICAL AND CHEMICAL PROPERTIES.

Molecular Mass,	N/A	Specific	
Solubility in Water;	N/A	Gravity @ 20°C,	0.99(solid).
Vapour Density,	N/A.	Vapour pressure,	N/A.
Freezing Point,	138-142°C.	Flash Point,	285°C.
Viscosity,	N/A.	pH,	N/A.
Appearance,	White powder.		
Odour,	None.		



## Abril Industrial Waxes Limited

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### X. STABILITY AND REACTIVITY.

- Conditions to Avoid. The product is stable under normal conditions. Avoid extremes of temperature and dampness.
- Materials to Avoid. Strong oxidising agents.
- Hazardous Decomposition Products. Thermal decomposition can produce oxides of carbon and nitrogen.

### XI. TOXICOLOGICAL INFORMATION.

- ORAL, LD50 (rat) 15.38 g/kg bodyweight. Essentially non toxic.
- DERMAL, Expected to be non toxic by dermal route.
- INHALATION, No data exists at present.
- EYES, Slightly irritant to rabbit eyes.

### XII. ECOLOGICAL INFORMATION.

Can be assumed to be biodegradable.

### XIII. DISPOSAL CONSIDERATIONS.

- Disposal Dangers, No dangers noted.
- Disposal Methods. To landfill tip, use licensed contractor and conform to local regulations.

### XIV. TRANSPORT INFORMATION.

- Not assigned in the following; Carriage of Dangerous Goods by Road and Rail ( Classification, Packaging and Labelling ) Regulation 1994.



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### XV. REGULATORY INFORMATION.

Primary Risk,	N/A.	Secondary Risk,	N/A.
S.I. Number,	N/A.	Conveyance Class,	N/A.
ADR Class,	N/A.	ADR HIN,	N/A.
Tremcard Number,	N/A.	EINECS Number,	N/A.
IATA Special Prov,	N/A.	IMDG Code ( page ),	N/A.
UN Number,	N/A.	IMCO Class,	N/A.
CAS Number,	110-30-5.	Packing Group,	N/A.
EINECS Number,	203-755-6.	UK Customs Number,	N/A.

Risk Phrases; Not classified as dangerous according to Directive 67/548/EEC or it's amendments. No risk phrases recommended.

Safety Phrases; Not classified as dangerous according to Directive 67/548/EEC or it's amendments. No safety phrases recommended.

SUPPLY LABEL, N/A. CARRIAGE LABEL, N/A.

### XVI. Other Information.

Information in this publication is believed to be accurate and is given in good faith, but it is for the customer to satisfy himself of the suitability for its own particular purpose. Accordingly, Abril gives no warranty as to the fitness of the product for any particular purpose and any warranty or condition ( statutory or otherwise ) is excluded except to the extent that such exclusion is prevented by law.

E&OE.

# SAMPLE AND TEST MATERIALS

09/02/97

MANUFACTURER	DATE	DESCRIPTION
AKZO	08/02/93	MLH 78 WHITE POLYESTER
AKZO	08/02/93	MLH 80-2 WHITE POLY.
AKZO	01/19/95	JLC 2395 WHITE LINER
AKZO	07/12/95	374-C27-0100 EPOXY LINING
CASTROL	11/01/91	CASTROL KLEEN 3625
CHEVRON	07/02/96	CHEVRON 1122B
FISHER	06/25/97	SQUALENE
MEHNERT & VEECK		IL-320-1528/45
MORTON	06/11/97	379W141 WHITE POLYESTER
MORTON	09/06/96	379W25 WHITE POLYESTER
MORTON	09/06/96	379W138 WHITE POLYESTER
PETRO PRODUCTS	08/09/88	100 SOLVENT
QUANTUM	06/21/93	LS 506000
TECHNICAL COATINGS	09/13/96	2BR79 BRUSHED POLYESTER
WATSON STANDARD	11/06/95	20-136-CF

# SAMPLE AND TEST MATERIALS

09/02/97

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WATSON STANDARD	11/06/95	20-136-CF



# MATERIAL SAFETY DATA SHEET

H. S H3\* F3 R1 WHMIS: B2;D2A Date Prepared: 08/02/93  
 Date Revised : 08/02/93

PREPARED FOR:

PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO COATINGS INC. - ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000

DOWNERS GROVE IL 60515

ZION IL 60099

Emergency Phone Number:

(708) 872-1000

Information Number:

(708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:

NA

Product No.

MLH 78

Customer Part No.

Product - Class: POLYESTER TUBE WHITE

DOT Code : NA

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data		
TITANIUM DIOXIDE	% by Weight		
	Cas No.	013463-67-7	
	Vapor Pres.	NA	
	TLV-TWA	10.0	mg/m3
	PEL-TWA	10.0	mg/m3
AROMATIC SOLVENT	% by Weight		
	Cas No.	-	-
	Vapor Pres.	NA	
	TLV-TWA	100.0	ppm
	PEL-TWA	NA	
HELMINE-FORMALDEHYDE RESIN	% by Weight		
	Cas No.	-	-
	Vapor Pres.	NA	
	TLV-TWA	NA	
	PEL-TWA	NA	
METHYLATED M/F RESIN	% by Weight		
	Cas No.	068002-20-0	
	Vapor Pres.	NA	
	TLV-TWA	NA	
	PEL-TWA	NA	
PHTHALENE	% by Weight	1.7 %	
	Cas No.	000091-20-3	
	Vapor Pres.	< 10.68E	mm/Hg
	TLV-TWA	10.0	ppm

	PEL-TWA	10.0	ppm	
	TLV-STEL	15.0	ppm	30 MINUTES
	PEL-STEL	15.0	ppm	30 MINUTES
	ORAL-LD50	1250.	mg/Kg	RAT
MORPHOUS SILICA	% by Weight			
	Cas No.	112926-00-8		
	Vapor Pres.	NA		
	TLV-TWA	10.0	mg/m3	
	PEL-TWA	6.0	mg/m3	
ALUMINUM OXIDE	% by Weight			
	Cas No.	001344-28-1		
	Vapor Pres.	NA		
	TLV-TWA	10.0	mg/m3	
	PEL-TWA	10.0	mg/m3	
ALPHA-HYDROXY TOLUENE	% by Weight			
	Cas No.	000100-51-6		
	Vapor Pres.	.1@ 86F	mm/Hg	
	TLV-TWA	NA		
	PEL-TWA	NA		
	ORAL-LD50	1230.	mg/Kg	RAT
	DERM-LD50	2000.	mg/Kg	RABBIT
	Inhalation	1000.	ppm	RAT-8 HOUR

1 material is subject to reporting under SARA TITLE III, SECTION 313  
1 components in this coating have been verified as being on the TSCA Inventory

### SECTION III - PHYSICAL DATA

Physical state: LIQUID

Odor and appearance: NA

Odor threshold (ppm): .0380

pH: NA

Boiling Range: 275 - 410 F ( 135 - 210 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 39.02

Lb/gal(U.S.)11.83

SpGr: 1.42

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	2.95	Total Organic Solvents	2.95
Less Water & Exempt (EPA)	2.95	Total Non-Exempt Solvents	2.95

Solvent Density 7.5690

---

SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED) 80 F ( 26 C) LEL .80%  
Flammability Class (OSHA): FLAMMABLE LIQUID - 1C

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE: MAY CAUSE EYE BURNS. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE DELAYED SKIN REACTIONS. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: pneumoconiosis, drying of nasal mucosa, fatigue, vomiting, cough, weakness, asphyxia, gastritis, shortness of breath, unconsciousness, inflammation of the mucous membranes of the nose and throat, reduced visibility, deposits in eyes, dermatitis, dehydration to skin, abdominal pain.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, eye disorders, respiratory allergies.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, lung damage, cardiac abnormalities, blood effects.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

---

**\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\***

---

**SKIN CONTACT:** Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

**EYE CONTACT:** Flush with water for at least 15 minutes and get medical attention.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

**INGESTION:** Get medical attention IMMEDIATELY.

---

**SECTION VI - REACTIVITY DATA**

---

**Material is STABLE** under non-emergency conditions.

**Material WILL NOT** undergo hazardous polymerization.

**HAZARDOUS DECOMPOSITION PRODUCTS:** oxides of carbon, oxides of nitrogen, toxic fumes, fumes, various hydrocarbons, formaldehyde, aldehydes, methanol, ethanol.

**CONDITIONS TO AVOID:** temperatures above 100 degrees, open flame, sparks, dusty conditions.

**MATERIALS TO AVOID:** alkali, acids, oxidizers, hydrogen fluoride, chlorine trifluoride.

---

**SECTION VII - SPILL AND LEAK PROCEDURES**

---

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

**SECTION VIII - SAFE HANDLING AND USE INFORMATION**

---

**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when

---

handling this product. Check with glove manufacturer to determine proper glove type.

YE PROTECTION: Face-shield should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGIENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

#### SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: naphthalene.

#### SECTION X - OTHER INFORMATION

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

#### ABBREVIATIONS USED IN PREPARING THIS MSDS :

HMIS - Workplace Hazardous Materials Information System

SCA - Toxic Substances Control Act

FR - Code of Federal Regulations

g/M<sup>3</sup> - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

P - Flash Point

lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

g/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

lb - Pounds

AS No - Chemical Abstract Number

HT - Hazardous Material Information System

LD50 - Oral Lethal Dose (50% Death)

HAL-LC50 - Inhalation Lethal Concentration (50% Death)

DM-LD50 - Dermal Lethal Dose (50% Death)

PL - Permissible Exposure Limit

TLV - Threshold Limit Value

SEL - Short Term Exposure Limit

CEL - Ceiling Limit

- At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

CERCLA - Superfund Amendments & Reauthorization Act (1986)

DOT - Department of Transportation



# Technical Data

## Container Coatings Division

CUSTOMER J.L. CLARK  
AKZO CODE MLH 78 PRODUCT NAME POLYESTER TUBE WHITE  
CUSTOMER CODE \_\_\_\_\_ COLOR WHITE  
SUGGESTED USE EXTERIOR COATING FOR COLLAPSABLE TUBE

### PHYSICAL DATA

Non-Volatiles (Vol) 61.0 +/- 2.0% Resin Type POLYESTER  
Non-Volatiles (Wt) 75.0 +/- 2.0% Solvents AROMATIC, KETONES  
Weight Per Gallon 11.82 +/- .2 VOC (ASTM #D 6885) 2.9  
Viscosity 90-100 K.U. Tube POLYETHYLENE  
Flash Point 80° CLOSED CUP Specific Gravity \_\_\_\_\_

### APPLICATION DATA

Substrate TFS \_\_\_\_\_ FEP \_\_\_\_\_ Other \*1  
Preparation (Surface) \_\_\_\_\_  
Film Weight (mg/cm<sup>2</sup>) \_\_\_\_\_ 17.5 - 22.5  
Application Viscosity 90 - 100 K.U.  
Cure Method \_\_\_\_\_  
Bake 325 +/- 25° Bake Time (Min) 3 MINUTES  
Alternative Bake \_\_\_\_\_ ° Bake Time (Min) \_\_\_\_\_  
Maximum Application Rate \_\_\_\_\_ cm/min Spray \_\_\_\_\_ \*2  
Maximum Production Rate \_\_\_\_\_ cm/min S150 Solvent \_\_\_\_\_  
Thinning for Cleanup MEK

### ADDITIONAL INFORMATION

Mixing & Storage Instructions: Mix well before using. Recommend to use product in 6 months or less.

Store at 77°F or below for maximum stability.

FDA status Yes ☒ No ☐ Process Yes ☒ No ☐ Limited ☐

### COMMENTS

\*1 EXTRUDED ALUMINUM AND TIN TUBES

\*2 TUBE COATER

THIS TDS SUPERCEDES ANY PREVIOUSLY DATED TDS.

DATE AUGUST 3, 1993

SIGNATURE Michael L. Hanninen

This technical information is offered solely for your evaluation. Akzo Coatings Inc. makes no warranty, nor assumes legal liability for results based upon use of our data and suggestions. Disclosure of data contained herein is neither authorization to operate under no recommendation to infringe any patents.

# MATERIAL SAFETY DATA SHEET

F 3 H3\* F3 R1 WHMIS: B2;D2A

Date Prepared: 08/02/93  
Date Revised: 08/02/93

PREPARED FOR:

PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO COATINGS INC. - ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000

DOWNERS GROVE IL 60515 ZION IL 60099

Emergency Phone Number: (708) 872-1000  
Information Number: (708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:  
NA

Product No.  
MLH 80-2

Customer Part No.

Product - Class: POLYESTER TUBE WHITE

DOT Code: NA

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
TITANIUM DIOXIDE	% by Weight Cas No. 013463-67-7 Vapor Pres. NA TLV-TWA 10.0 mg/m3 PEL-TWA 10.0 mg/m3
AROMATIC SOLVENT	% by Weight Cas No. - - Vapor Pres. NA TLV-TWA 100.0 ppm PEL-TWA NA
MELAMINE-FORMALDEHYDE RESIN	% by Weight Cas No. - - Vapor Pres. NA TLV-TWA NA PEL-TWA NA
METHYLATED M/F RESIN	% by Weight Cas No. 068002-20-0 Vapor Pres. NA TLV-TWA NA PEL-TWA NA
PHENYLTHALENE	% by Weight 1.7 % Cas No. 000091-20-3 Vapor Pres. < 10.68E mm/Hg TLV-TWA 10.0 ppm



	PEL-TWA	10.0	ppm	
	TLV-STEL	15.0	ppm	30 MINUTES
	PEL-STEL	15.0	ppm	30 MINUTES
	ORAL-LD50	1250.	mg/Kg	RAT
AMORPHOUS SILICA	% by Weight			
	Cas No.	112926-00-8		
	Vapor Pres.	NA		
	TLV-TWA	10.0	mg/m3	
	PEL-TWA	6.0	mg/m3	
ALUMINUM OXIDE	% by Weight			
	Cas No.	001344-28-1		
	Vapor Pres.	NA		
	TLV-TWA	10.0	mg/m3	
	PEL-TWA	10.0	mg/m3	
ALPHA-HYDROXY TOLUENE	% by Weight			
	Cas No.	000100-51-6		
	Vapor Pres.	.1@ 86F	mm/Hg	
	TLV-TWA	NA		
	PEL-TWA	NA		
	ORAL-LD50	1230.	mg/Kg	RAT
	DERM-LD50	2000.	mg/Kg	RABBIT
	Inhalation	1000.	ppm	RAT-9 HOUR

#7 s material is subject to reporting under SARA TITLE III, SECTION 313  
 All components in this coating have been verified as being on the TSCA Inventory

### SECTION III - PHYSICAL DATA

Physical state: LIQUID

Odor and appearance: NA

Odor threshold (ppm): .0380

pH: NA

Boiling Range: 275 - 410 F ( 135 - 210 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 38.86 Lb/gal(U.S.) 11.86 SpGr: 1.4

VOC Data Lb/Gal(U.S.):

Less Water (EPA) 2.94 Total Organic Solvents 2.94

Less Water & Exempt (EPA) 2.94 Total Non-Exempt Solvents 2.94

Solvent Density 7.5860

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SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

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FP: (CLOSED) 80 F ( 26 C) LEL .80%  
Flammability Class (OSHA): FLAMMABLE LIQUID - 1C

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

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SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

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EFFECTS OF OVEREXPOSURE: MAY CAUSE EYE BURNS. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE DELAYED SKIN REACTIONS. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: pneumoconiosis, drying of nasal mucosa, fatigue, vomiting, cough, weakness, asphyxia, gastritis, shortness of breath, unconsciousness, inflammation of the mucous membranes of the nose and throat, reduced visibility, deposits in eyes, dermatitis, dehydration to skin, abdominal pain.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, eye disorders, respiratory allergies.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, lung damage, cardiac abnormalities, blood effects.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

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**\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\***

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**SKIN CONTACT:** Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

**EYE CONTACT:** Flush with water for at least 15 minutes and get medical attention.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

**INGESTION:** Get medical attention IMMEDIATELY.

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**SECTION VI - REACTIVITY DATA**

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Material is **STABLE** under non-emergency conditions

Material **WILL NOT** undergo hazardous polymerization.

**HAZARDOUS DECOMPOSITION PRODUCTS:** oxides of carbon, oxides of nitrogen, toxic fumes, fumes, various hydrocarbons, formaldehyde, aldehydes, methanol, ethanol.

**CONDITIONS TO AVOID:** temperatures above 100 degrees, open flame, sparks, dusty conditions.

**MATERIALS TO AVOID:** alkali, acids, oxidizers, hydrogen fluoride, chlorine trifluoride.

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**SECTION VII - SPILL AND LEAK PROCEDURES**

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**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

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**SECTION VIII - SAFE HANDLING AND USE INFORMATION**

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**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when

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handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Face-shield should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGIENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

#### SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: naphthalene.

#### SECTION X - OTHER INFORMATION

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

#### ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than                      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number  
HMT - Hazardous Material Information System  
OR, LD50 - Oral Lethal Dose (50% Death)  
INHAL-LC50 - Inhalation Lethal Concentration (50% Death)  
DERM-LD50 - Dermal Lethal Dose (50% Death)  
PEL - Permissible Exposure Limit  
TLV - Threshold Limit Value  
STEL - Short Term Exposure Limit  
CEIL - Ceiling Limit  
@ - At  
OSHA - Occupational Safety and Health Administration  
IARC - International Agency for Research on Cancer  
NTP - National Toxicology Program  
SARA - Superfund Amendments & Reauthorization Act (1986)  
DOT - Department of Transportation



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# Technical Data

## Container Coatings Division

CUSTOMER J.L. CLARK  
AKZO CODE MLH 80-2 PRODUCT NAME POLYESTER TUBE WHITE  
CUSTOMER CODE \_\_\_\_\_ COLOR WHITE  
SUGGESTED USE EXTERIOR COATING FOR COLLAPSABLE TUBE

### PHYSICAL DATA

Non-Volatiles Vol. 61.0 +/- 2.0% Resin Type POLYESTER  
Non-Volatiles Wt. 75.0 +/- 2.0% Solvents AROMATIC, KETONES  
Weight Per Gallon 11.82 +/- .2 VOC (ASTM #D 1960-89) 2.9  
Viscosity 90-100 K.U. Lube POLYETHYLENE  
Flash Point 80° CLOSED CUP Specific Gravity \_\_\_\_\_

### APPLICATION DATA

Substrate TES ETP \_\_\_\_\_ Other \*1  
Film Thickness \_\_\_\_\_  
Film Weight (in lb) \_\_\_\_\_ 17.5 - 22.5  
App. Viscosity 90 - 100 K.U.  
Dry Speed \_\_\_\_\_  
Dry 300 +/- 25°F Min. Time 3 MINUTES  
Min. Dry Rate \_\_\_\_\_ Min. Time 3  
Min. Temp. for App. \_\_\_\_\_  
Min. Temp. for Cure 150  
Min. Temp. for Cure MEK

### ADDITIONAL INFORMATION

Mixing & Storing Instructions: Mix well before using. Recommend to use product in 6 months or less.

Store at 77°F or below for maximum stability.

FDA status Yes ☒ No Process Yes ☒ No Limited\*

### \*COMMENTS

\*1 EXTRUDED ALUMINUM AND TIN TUBES

\*2 TUBE COATER

THIS TDS SUPERCEDES ANY PREVIOUSLY DATED TDS.

DATE AUGUST 3, 1993

SIGNATURE Michael L. Hanninen

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MATERIAL SAFETY DATA SHEET

HMIS H3 F2 R0 WHMIS: B3;D2B

Date Prepared: 01/19/95

Date Revised: 01/19/95

PREPARED FOR:

PREPARED BY:

365050 JL CLARK/DOWNERS GROVE  
2300 WISCONSIN AVE.  
DOWNERS GROVE IL 60515

AKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000  
ZION IL 60099-1494

Emergency Phone Number:  
Information Number:

(708) 872-1000  
(708) 872-1000

SECTION I - PRODUCT INFORMATION

Tradename:  
NA

Product No.  
~~MM-22~~ JLC 2395

Customer Part No.

Product - Class: WHITE TUBE LINER

SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
AROMATIC SOLVENT	% by Weight ICas No. - - IVapor Pres. NA ITLU-TWA 100.0 ppm IPEL-TWA NA I
MELAMINE-FORMALDEHYDE RESIN	% by Weight ICas No. - - IVapor Pres. NA ITLU-TWA NA IPEL-TWA NA I
#2-BUTOXYETHANOL (ETHYLENE GLYCOL BUTYL ETHER)	% by Weight 9.5 % ICas No. 000111-76-2 IVapor Pres. .6@ 68F mm/Hg ITLU-TWA 25.0 ppm* IPEL-TWA 50.0 ppm* IORAL-LD50 1480. mg/Kg RAT IDERM-LD50 490. mg/Kg RABBIT Inhalation 700. ppm MOUSE-7 HOUR I
TITANIUM DIOXIDE	% by Weight ICas No. 013463-67-7 IVapor Pres. NA ITLU-TWA 10.0 mg/m3 IPEL-TWA 15.0 mg/m3 I
#1,2,4-TRIMETHYLBENZENE	% by Weight 3.9 % ICas No. 000095-63-6 IVapor Pres. NA

	ITLV-TWA	25.0	ppm	
	IPEL-TWA	25.0	ppm	
	Inhalation	18000.	mg/m3	RAT-4 HOUR
ISOBUTANOL	1% by Weight			
(ISOBUTYL ALCOHOL)	ICas No.	000078-83-1		
(2-METHYL-1-PROPANOL)	I Vapor Pres.	9.0@ 68F	mm/Hg	
	ITLV-TWA	50.0	ppm	
	IPEL-TWA	100.0	ppm	
	IORAL-LD50	2460.	mg/Kg	RAT
	IDERM-LD50	4240.	mg/Kg	RABBIT
#NAPHTHALENE	1% by Weight	1.9 %		
	ICas No.	000091-20-3		
	I Vapor Pres.	< .1@ 68F	mm/Hg	
	ITLV-TWA	10.0	ppm	
	IPEL-TWA	10.0	ppm	
	ITLV-STEL	15.0	ppm	30 MINUTES
	IPEL-STEL	15.0	ppm	30 MINUTES
	IORAL-LD50	1250.	mg/Kg	RAT
METHOXY-METHYL ETHOXY PROPANOL	1% by Weight	< 1.0%		
	ICas No.	034590-94-8		
	I Vapor Pres.	.4@ 77F	mm/Hg	
	ITLV-TWA	100.0	ppm*	
	IPEL-TWA	100.0	ppm*	
	ITLV-STEL	150.0	ppm*	15 MINUTES
	IPEL-STEL	150.0	ppm*	15 MINUTES
	IORAL-LD50	5660.	mg/Kg	RAT
	IDERM-LD50	9500.	mg/Kg	RAT

#This material is subject to reporting under SARA TITLE III, SECTION 313  
All components in this coating have been verified as being on the TSCA Inventory

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

### SECTION III - PHYSICAL DATA

Physical state: LIQUID

Odor and appearance: NA

Odor threshold (ppm): .0380

pH: NA

Boiling Range: 228 - 362 F ( 108 - 183 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 53.91

Lb/gal(U.S.) 8.88

SpGr: 1.06

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	4.01	Total Organic Solvents	4.01
Less Water & Exempt (EPA)	4.01	Total Non-Exempt Solvents	4.01



Solvent Density 7.4450

#### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

FP: (CLOSED) 112 F ( 44 C) LEL 1.00%  
Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2  
This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

#### SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

EFFECTS OF OVEREXPOSURE: CAUSES EYE BURNS. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. CAN BE ABSORBED THROUGH SKIN. CAUSES SKIN BURNS. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: dizziness, nausea, narcosis, headache, pneumoconiosis, drying of nasal mucosa, depression, fatigue, vomiting, weakness, asphyxia, drowsiness, gastritis, shortness of breath, unconsciousness, inflammation of the mucous membranes of the nose and throat, reduced visibility, deposits in eyes, dermatitis, diarrhea, loss of coordination, necrosis of the skin, lacrimation, conjunctivitis, hemolysis.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders.

#### CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, cardiac abnormalities, blood effects, eye damage.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*.

SKIN CONTACT: Flush with water for at least 15 minutes and get medical attention. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen, toxic fumes, fumes, various hydrocarbons, formaldehyde, aldehydes.

CONDITIONS TO AVOID: temperatures above 100 degrees, open flame, sparks.

MATERIALS TO AVOID: alkali, acids, oxidizers, oxygen, extended contact with air.

SECTION VII - SPILL AND LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

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SECTION VIII - SAFE HANDLING AND USE INFORMATION

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**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

**EYE PROTECTION:** Splash-proof chemical goggles should be worn.

**OTHER PROTECTIVE EQUIPMENT:** Eye bath and safety shower should be provided. Rubber apron should be worn.

**HYGENIC PRACTICES:** Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

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SECTION IX - SPECIAL PRECAUTIONS

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**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area. Store away from open flame.

**OTHER PRECAUTIONS:** All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: glycol ether, naphthalene, trimethylbenzene.

This product contains the following substance(s) listed by the U.S. EPA as Hazardous Air Pollutants: naphthalene, glycol ethers.

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SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

**Disclaimer:** While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

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DOT Proper Shipping Classification -

ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

&gt; - Greater Than &lt; - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

ST - Short Term Exposure Limit

CEL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SARA - Superfund Amendments &amp; Reauthorization Act (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HMIS: H3\* F3 R0 WHMIS: B2; D2B Date Prepared: 02/12/95  
Date Revised: 02/16/95

PREPARED FOR: 365050 JL CLARK/DOWNERS GROVE  
2300 WISCONSIN AVE.  
DOWNERS GROVE IL 60515  
PREPARED BY: AKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000  
ZION IL 60099-1494  
Emergency Phone Number: (708) 872-1000  
Information Number: (708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename: NA Product No. 374- C27-0100 Customer Part No.

Product - Class: EPOXY LINING

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
METHYL ETHYL KETONE (MEK) (2-BUTANONE)	% by Weight 39.2 % ICas No. 000078-93-3 IVapor Pres. 93.0 mm/Hg @ 75F ITLU-TWA 200.0 ppm IPEL-TWA 200.0 ppm ITLU-STEL 300.0 ppm 15 MINUTES IPEL-STEL 300.0 ppm 15 MINUTES IORAL-LD50 2737. mg/Kg RAT IDERM-LD50 13000. mg/Kg RABBIT
#TOLUENE (TOLUOL) (METHYL BENZENE)	% by Weight 15.8 % ICas No. 000108-88-3 IVapor Pres. 22.0 mm/Hg @ 68F ITLU-TWA 50.0 ppm IPEL-TWA 200.0 ppm IPEL-STEL 500.0 ppm 10 MINUTES IPEL-CEIL 300.0 ppm IORAL-LD50 5000. mg/Kg RAT IDERM-LD50 14000. mg/Kg RABBIT Inhalation 4000. ppm RAT-4 HOUR
EPOXY RESIN	% by Weight ICas No. 025068-38-6 IVapor Pres. 8.2 mm/Hg @ 24F ITLU-TWA NA IPEL-TWA NA
1-METHOXY-2-ACETOXYPROPANE	% by Weight ICas No. 000108-65-6 IVapor Pres. 3.4 mm/Hg @ 68F

SAMPLE TEST

	ITLV-TWA	100.0	ppm
	IPEL-TWA	NA	
	ORAL-LD50	8532.	mg/Kg RAT-FEMALE
	DERM-LD50	> 5000.	mg/Kg RABBIT
ISOPHORONE	% by Weight		
	ICas No.	000078-59-1	
	Vapor Pres.	1.0 mm/Hg @ 68F	
	ITLV-TWA	5.0	ppm
	IPEL-TWA	25.0	ppm
	ORAL-LD50	2330.	mg/Kg RAT
	DERM-LD50	1500.	mg/Kg RABBIT
#BUTOXYETHYL ACETATE	% by Weight	6.2 %	
	ICas No.	000112-07-2	
	Vapor Pres.	.2 mm/Hg @ 68F	
	ITLV-TWA	NA	
	IPEL-TWA	NA	
	ORAL-LD50	2400.	mg/Kg RAT
	DERM-LD50	1500.	mg/Kg RABBIT
PHENOXY RESIN	% by Weight		
	ICas No.	025068-38-6	
	Vapor Pres.	NA	
	ITLV-TWA	10.0	mg/m3
	IPEL-TWA	15.0	mg/m3
# MHYL ISOBUTYL KETONE (MIBK) (4-METHYL-2-PENTANONE)	% by Weight	3.9 %	
	ICas No.	000108-10-1	
	Vapor Pres.	15.0 mm/Hg @ 68F	
	ITLV-TWA	50.0	ppm
	IPEL-TWA	100.0	ppm
	ITLV-STEL	75.0	ppm 15 MINUTES
	ORAL-LD50	1600.	mg/Kg RAT
	Inhalation	2000.	ppm RAT-4 HOUR
4-HYDROXY-4-METHYL-2-PENTANONE (DIACETONE ALCOHOL)	% by Weight		
	ICas No.	000123-42-2	
	Vapor Pres.	.8 mm/Hg @ 68F	
	ITLV-TWA	50.0	ppm
	IPEL-TWA	50.0	ppm
	ORAL-LD50	4000.	mg/Kg RAT
	DERM-LD50	13500.	mg/Kg RABBIT
PHENOL-FORMALDEHYDE RESIN	% by Weight		
	ICas No.		
	Vapor Pres.	NA	
	ITLV-TWA	NA	
	IPEL-TWA	NA	

#This material is subject to reporting under SARA TITLE III, SECTION 313  
 A' components in this coating have been verified as being on the TSCA Inventory

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

## SECTION III - PHYSICAL DATA

Physical state: LIQUID

Odor and appearance: NA

Odor threshold (ppm): .1900

pH: NA

Boiling Range: 173 - 424 F ( 78 - 217 C)

Vapor is heavier than Air:

Evaporation rate is slower than ether.

% Volatile (vol) 87.08

Lb/gal (U.S.) 7.47

SpGr: .89

UCC Data Lb/Gal (U.S.):

Less Water (EPA)

Less Water &amp; Exempt (EPA)

6.19 Total Organic Solvents

6.19 Total Non-Exempt Solvents

6.18

6.18

Solvent Density 7.10

## SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

FP: (CLOSED)

25 F ( -3 C)

LEL .50%

Flammability Class (OSHA): FLAMMABLE-LIQUID-1B

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

## SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

EFFECTS OF OVEREXPOSURE: CAUSES EYE BURNS. HARMFUL IF SWALLOWED. CAUSES NOSE AND THROAT IRRITATION. CAN BE ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: dizziness, nausea, narcosis, headache, pneumoconiosis, drying of nasal mucosa, fatigue, vomiting, cough, weakness, asphyxia, drowsiness, gastritis, shortness of breath, unconsciousness, reduced visibility, deposits in eyes, dermatitis, sneezing, dehydration to skin, loss of coordination, swelling and

redness of skin, redness and swelling of eyes, lacrimation, conjunctivitis, pneumonia, edema.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, lung damage, spleen damage, cardiac abnormalities, birth defects, blood effects, eye damage.

Caution: Contains isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP. Contains a phenol-formaldehyde resin which, under certain conditions, could release formaldehyde in sufficient quantities to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen, toxic fumes, various hydrocarbons, phenol, formaldehyde.

CONDITIONS TO AVOID: heat, open flame, sparks, dusty conditions.

MATERIALS TO AVOID: alkali, acids, oxidizers, reducing agents, amines, chlorinated solvents, aldehydes, halogenated solvents, alkanolamines, ammonia.



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## SECTION VII - SPILL AND LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

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## SECTION VIII - SAFE HANDLING AND USE INFORMATION

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RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Splash-proof chemical goggles should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

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## SECTION IX - SPECIAL PRECAUTIONS

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area. Avoid high temperatures and humidity.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues.

This product contains the following SARA Title III, Section 313, reportable materials: methyl ethyl ketone, methyl isobutyl ketone, toluene, glycol ether.

This product contains the following California Proposition 65 reproductive toxicants: toluene.

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SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Nobel Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Nobel Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, II

~~ABBREVIATIONS USED IN PREPARING THIS MSDS :~~

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

m - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than                      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEIL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SARA - Superfund Amendments & Reauthorization Act (1986)

DOT - Department of Transportation

Castrol Industrial  
Central Inc.  
MATERIAL SAFETY DATA SHEET  
Emergency Phone No.: (312) 454-1000  
Information Phone No.: (312) 454-1000

FIRE  
1  
HEALTH 3 0 REACTIVITY  
0  
SPECIAL

I. MATERIAL IDENTIFICATION

PRODUCT TRADE NAME: Castrol Kleen 3625  
MANUFACTURER: Castrol Industrial  
Central Inc.  
ADDRESS: 630 W. Washington Blvd. Chicago IL, 60661  
MFG. FACILITY ADDRESS: 149 S. Grant Street North Aurora IL, 60542  
Preparer: Harold Diaz Preparation Date: 11/01/1991

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS.	X	CAS No.	TLV (ACGIH)	PEL (OSHA)
Potassium hydroxide	1-5	1310-58-3	2mg/M3(ceiling)	2mg/M3(ceiling)
Ethanol, 2-amino	5-10	141-43-5	8 mg/M3	8 mg/M3

Contains no other ingredients now known to be hazardous as defined by OSHA 29 CFR 1910.1000 (subpart z) and OSHA CFR 29 1910.1200.

III. PHYSICAL PROPERTIES

APPEARANCE & ODOR: Brown liquid; mild odor  
BOILING POINT °F (°C): NA NA  
MELTING POINT °F (°C): NA NA  
SPECIFIC GRAVITY (H2O=1): 1.160 - 1.165  
VAPOR PRESSURE: 17 mmHg  
VAPOR DENSITY (AIR=1): 0.6  
EVAPORATION RATE (BUTYL ACETATE=1): < 1  
VOLATILES BY VOLUME: 76%  
SOLUBILITY IN H2O: Complete  
pH AS IS: 13.5  
pH (DILUTE): 12.2 - 12.6 @ 3 %

IV. FIRE AND EXPLOSION HAZARDS

FLASHPOINT (method used)

None °F None °C NA

FLAMMABLE LIMITS

LEL NA UEL NA

EXTINGUISHING MEDIA:

After water evaporates, residues will burn. Water, dry chemical, CO2, or "alcohol" foam.

SPECIAL FIRE FIGHTING PROCEDURES:

Wear self contained breathing apparatus when fire fighting in a confined space. Cool fire exposed containers with waterspray to prevent rupture.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Reacts with aluminum to release hydrogen which is a flammable gas.

CONTAINER HANDLING: DO NOT CUT OR WELD EMPTY DRUMS UNLESS THOROUGHLY CLEANED.

MSDS NUMBER: ck3625

REVISED: 11/01/1991

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## V. REACTIVITY DATA

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**STABILITY:** Stable- normal conditions

**CONDITIONS TO AVOID:** None

**COMPATIBILITIES:** Strong oxidizing agents Strong acids/ Aluminum, Zinc, Tin

**HAZARDOUS DECOMPOSITION:** Potential combustion products are oxides of carbon and nitrogen.

**HAZARDOUS POLYMERIZATION:** Will Not Polymerize

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## VI. HEALTH HAZARD SUMMARY

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### ROUTES OF EXPOSURE AND EFFECTS OF OVEREXPOSURE

#### EYES:

Concentrate is corrosive and will cause severe eye burn.

#### SKIN ABSORPTION:

Concentrate is corrosive.

#### SKIN CONTACT:

Concentrate is corrosive and will cause severe skin burns.

#### INHALATION:

Inhalation of high concentrations of mists may produce irritation and damage to the respiratory tract.

#### INGESTION:

LD50 not established. Internal irritation and damage can result.

### CHRONIC EFFECTS:

A review of the literature does not show obvious long term hazard.

**\*\*\*ESMOLO LIMIT VALUE:** none established for this mixture.

**CONTAINS KNOWN CARCINOGENS:** no      **NTP:** no      **IARC:** no      **OSHA:** no

Applies to concentrate. Hazard potential is reduced at use dilutions.

### EMERGENCY AND FIRST AID PROCEDURES

#### EYES:

Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

#### SKIN:

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing. Get medical attention. Wash clothing before reuse.

#### INHALATION:

If respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues.

#### INGESTION:

Do not induce vomiting; get medical attention immediately.

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## VII. CONTROL MEASURES

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### RESPIRATORY PROTECTION:

Good industrial hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the threshold limit value (TLV) or permissible exposure limit (PEL). If any associated TLV or PEL is exceeded, provide NIOSH approved respiratory protection.

### GLOVES:

Impervious gloves such as rubber should be used when handling this product.

### EYE PROTECTION:

Safety glasses with side shield or chemical goggles.

### OTHER:

Eyewash facility. Appropriate clothing to avoid skin contact.

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## VIII. PRECAUTIONS

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### CONTAINMENT PROCEDURES:

Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container. Flush residual spill with water. For large spills, neutralize with dilute mineral acid before disposal.

### WASTE DISPOSAL PROCEDURES:

Dispose of in accordance with local, state and federal regulations. Disposal of this material to the land may be banned by federal law (40 CFR 268).

### STORAGE AND HANDLING PROCEDURES:

DO NOT ADD NITRITES TO THIS FLUID. Avoid contact with skin and eyes. Avoid breathing mists. Do not take internally. Keep container closed when not in use. Bring product to room temperature before use.

### RCRA HAZARDOUS WASTE DESIGNATION:

This product does fall under current EPA RCRA definitions of hazardous waste with designation D002 because of its corrosivity or the product is disposed of in its original form.

### CERCLA REPORTABLE QUANTITY:

This product does contain a CERCLA regulated material - Potassium Hydroxide, RQ = 1000 lbs.

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## IX. OTHER HAZARD INFORMATION

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### Alkanolamine

This product contains an alkanolamine. In all metalworking fluids containing amines, there is a potential for forming nitrosamines which are animal carcinogens. Therefore, no nitrites or related nitrosating agents should be added to such compositions.

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**X. ADDITIONAL REGULATORY INFORMATION**

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**OCCUPATIONAL SAFETY and HEALTH ADMINISTRATION (OSHA)**

29 CFR 1910.1200 Hazardous Chemical: yes

REFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA)

Section 302, Extremely Hazardous Substance: no

Section 311, Hazardous Chemical: yes

Immediate: yes Delayed: no Fire: no Sudden Release: no Reactive: no

Section 313, Toxic Chemical: no

**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

This product is a mixture and is NOT listed in the TSCA Inventory. The individual ingredients in the product are listed in the TSCA Inventory.

**DEPARTMENT OF TRANSPORTATION (DOT)**

PROPER SHIPPING NAME: Corrosive Liquid NOS(contains KOH & Ethanolamine)

HAZARD CLASS (49 CFR 172.101): 8

HAZARD ID NUMBER: UN 1760

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**DISCLAIMER**

Information presented herein has been compiled from information provided to us by our suppliers and other sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief but is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or the use of any product in violation of any patent or in violation of any law or regulation. It is the users' responsibility to determine the suitability of any material for a specific purpose and to adopt such safety precautions as may be necessary. We make no warranty as to the results to be obtained in using any material and since conditions of use are not under our control, we must necessarily disclaim all liability with respect to the use of any material supplied by us.

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MEHNERT &amp; VEECK • LACKFABRIK



N Ü R N B E R G

**MATERIAL SAFETY DATA SHEET**

IN ACCORDANCE WITH GERMAN STANDARDS NO. 52 900 (DIN)

Supplier : MEHNERT & VEECK LACKFABRIK, Nuremberg,  
F.R.G.Product reference : Inwardly Protecting Lacquer for Tubes  
pigmented IL-320-1528/451.1 Chemical characterization: Combination of epoxy-phenolic  
resins dissolved in organic sol-  
vents and pigmented1.2 State liquid  
1.3 Colour light to dark beige  
1.4 Smell typical**2. Physical and safety technical data**

2.1 Concentration	approx. 1,04 g/cm <sup>3</sup>	DIN 53 217
2.2 Vapour pressure	<10 mbar	
2.3 Viscosity	approx. 45 sec.	DIN 53 211
2.4 Solubility in H <sub>2</sub> O	./.	
2.5 Flash point	above 21°C	DIN 53 213
2.6 Ignition temperature (solvent components)	200 to 300°C	DIN 51 794
2.7. Ignition limits	inferior: 1,1 superior: 12 vol. %	
2.8 Hazardous effects of decomposition	./.	
2.9 Hazardous reactions	none	
2.10 Steps to be taken	./.	

**3. Transport**

## Indications

GGVsea/IMDG-code:	./.
ICAO/IATA-DGR	: ./.
RID/ADR	: Cl. 3/ciph. 31c
UN-no.	: ./.
GGVE/GGVS	: Cl. 3/ciph. 31c
ADNR	: ./.

**4. Regulations**

contains xylene

**MEHNERT & VEECK ♦ LACKFABRIK****N Ü R N B E R G**

class of risk: A II

symbol: Xn

R 10  
R 20/21/22inflammable  
inhalation, ingestion and dermal  
contact are considered noxious

S 1/2

to be stored under lock and  
in accessible to children

S 16

smoking prohibited - to be kept  
apart from open flames

S 24/25

avoid eye- and skin-contact

**5. Safety measures, storage and handling****5.1 Technical safety measures**the product should be  
stored in cool and well  
aerated places**5.2 Protective equipment**respiration, eyes and  
hands in case of frequent  
contact**5.3 Working hygiene**spoiled, soaked clothing  
should be removed immed.  
and washed thoroughly**5.4 Protecting against fire**abstain from smoking and  
keep away open flames**5.5 Disposal**combustion facility or  
official disposal**6. Measures to be taken in case of accidents and fire****6.1 Steps to be taken if material is spilled or released**Use absorber and proceed in compliance with the  
waste removal regulations**6.2 Extinguishing media**

foam, Co: Dry extinguishing media



MEHNERT &amp; VEECK ♦ LACKFABRIK



N Ü R N B E R G

### 6.3 First aid in case of

inhalation

remove person concerned immed.  
the area of danger; if respir-  
ation is irregular or stands  
still, proceed to artificial  
respiration; get medical att.

dermal contact

remove without delay the clothing  
spoiled; flush thoroughly with  
soap and water the skin affected  
flush with plenty of water for at  
least 10 to 15 minutes

eye contact

do not induce vomiting; lay down  
the person concerned in a quiet  
place, get medical attention

ingestion

### 7. Toxicology

Inhalation

high concentrations cause irrit-  
ation of mucous membranes as well  
as an intoxicating effect.

Dermal contact

Reaction time and sense of co-  
ordination might be affected  
frequent and long-lasting dermal  
contact may cause irritation and  
inflammation

Eye contact

irritation

Ingestion

even slight quantities may  
cause considerable health dis-  
orders

### 8. Ecology

the product should not get  
into waters

#### Please note:

The above information is accurate to the best of our knowledge.  
It is meant to advise and counsel, however, without any  
liability.

MSDS Number...: 59362-1-1  
379W25 H S WHITE POLYESTER  
Effective.....: 9/06/96      Supersedes.....: 9/06/96

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product ID: 379W25 H S WHITE POLYESTER  
Generic Description: Colored Liquid  
Product Use: Coating

For general information, contact:  
Morton Industrial Coatings  
Haynes Circle  
Chicopee MA 01020  
413-592-4191

MSDS prepared by:  
Toxicology and Regulated Substance Compliance  
David Wienckowski, D.A.B.T.  
100 N. Riverside Plaza  
Chicago IL 60606  
312-807-3422

ChemTrec Emergency                      1-800-424-9300

Hazard Ratings	HMIS	NFPA	* = Chronic
Health	2 *	2	
Flame	3	3	
Reactivity	0	0	

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMMON NAME	CAS #	Approximate % (w/w)
Titanium Dioxide	13463-67-7	36.3
Heavy aromatic solvent naphtha	64742-94-5	6.7
Polymer	Proprietary	5.2
Light aromatic solvent naphtha (C8-C10)	64742-95-6	3.6
1,2,4-trimethylbenzene	95-63-6	2.9
Butyl alcohol, n-	71-36-3	2.4
Trimethyl benzene	25551-13-7	2.1
Silica, amorphous	7631-86-9	2.0
Ethyl beta-ethoxypropionate	763-69-9	1.7
Xylene	1330-20-7	1.3
Formaldehyde	50-00-0	< 0.1
Non-hazardous and other ingredients below reportable levels	Proprietary	Balance

MSDS Number...: 59362-1-1  
379W25 H S WHITE POLYESTER  
Effective.....: 9/06/96 Supersedes.....: 9/06/96

### 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: FLAMMABLE LIQUID AND VAPOR. MAY CAUSE ALLERGIC SKIN REACTION AND SENSITIZATION. CAUSES SEVERE EYE IRRITATION. INHALATION MAY CAUSE DIZZINESS, HEADACHE AND INCOORDINATION. INGESTION CAN CAUSE DIZZINESS, FAINTNESS, HEADACHE AND INCOORDINATION. INGESTION MAY CAUSE INFLAMMATION OF THE LUNGS. MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE DIGESTIVE TRACT IRRITATION. INGESTION MAY CAUSE NAUSEA, VOMITING, PAIN, UPSET STOMACH, DIARRHEA. INHALATION MAY CAUSE NAUSEA, VOMITING, UPSET STOMACH. MAY CAUSE SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. See sections 3, 5, & 6.

PRIMARY ROUTES OF EXPOSURE: Eye. Skin. Inhalation (breathing).

EYE CONTACT: Causes severe irritation.

SKIN CONTACT: Prolonged or repeated contact may dry the skin and lead to irritation (i.e. dermatitis). May cause slight to mild irritation. May cause allergic skin reactions and sensitization.

INHALATION (Breathing): Irritating to the eyes, nose, and respiratory tract. Can cause wheezing, coughing, shortness of breath, and tightness in the chest. Can cause dizziness, headaches, and incoordination. Nausea, vomiting, and stomach upset can occur.

INGESTION (Swallowing): Irritating to the mouth, throat, and stomach. May cause nausea, vomiting, pain, and stomach upset (e.g., diarrhea). Can cause dizziness, faintness, headache, and incoordination. Possible aspiration hazard. May cause inflammation of the lungs.

TARGET ORGANS/CHRONIC EFFECTS: Lungs and respiratory system. Eyes. Skin. Immune system (e.g, allergic reactions). Nervous system.

CONDITIONS AGGRAVATED BY EXPOSURE: Lungs and respiratory system. Skin. Immune systems and/or specific chemical allergies.

#### CARCINOGENICITY:

	ACGIH	IARC	NTP	OSHA
Titanium Dioxide	No	No	No	No
Heavy aromatic solvent naphtha	No	No	No	No
Polymer	No	No	No	No
Light aromatic solvent naphtha (C8-C10)	No	No	No	No
1,2,4-trimethylbenzene	No	No	No	No
Butyl alcohol, n-	No	No	No	No
Trimethyl benzene	No	No	No	No
Silica, amorphous	No	No	No	No
Ethyl beta-ethoxypropionate	No	No	No	No
Xylene	No	No	No	No
Formaldehyde	A2	2A	Yes	Yes

MSDS Number...: 59362-1-1  
379W25 H S WHITE POLYESTER  
Effective.....: 9/06/96      Supersedes.....: 9/06/96

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#### 4. FIRST AID MEASURES

\*

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Get prompt medical attention.

**SKIN CONTACT:** Immediately flush with water. Remove contaminated clothing and shoes. Get medical attention if irritation persists. Professionally wash clothing and shoes before re-use.

**INHALATION (Breathing):** Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration.

**INGESTION (Swallowing):** Seek medical attention. Immediately induce vomiting, as directed by medical personnel. Never give anything by mouth to an unconscious person.

**NOTES TO PHYSICIANS:** Treatment should be directed at preventing absorption, administering to symptoms (if they occur), and providing supportive therapy.

#### 5. FIRE FIGHTING METHODS

\*

Flash Point...: 85F 29.4C      Method.....: Tagliabue Closed Cup  
Explosive Lmts: LEL(%) Not Determined UEL(%) Not Determined  
Autoignition...: Not Determined

**1. RDOUS COMBUSTION AND DECOMPOSITION PRODUCTS:** Smoke, soot, and toxic/irritating fumes (i.e., carbon dioxide, carbon monoxide, etc.). Oxides of nitrogen.

**FIRE AND EXPLOSION HAZARDS:** High temperatures can cause sealed containers to rupture due to a build up of internal pressure. Cool with water. Vapors can travel to a source of ignition (flame, electric motor, hot surface, cigarette, etc.) and flash back. During a fire, irritating and highly toxic gases may be generated during combustion or decomposition.

**EXTINGUISHING MEDIA:** **SMALL FIRES:** Dry chemical, carbon dioxide, halon, water spray, or foam. **LARGE FIRES:** Water spray, fog, or alcohol foam.

**FIRE FIGHTING PROCEDURES/EQUIPMENT:** Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH-approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.

#### 6. ACCIDENTAL RELEASE MEASURES

\*

**EVACUATION:** Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Eliminate all sources of ignition.

MSDS Number...: 59362-1-1  
379W25 H S WHITE POLYESTER  
Effective.....: 9/06/96      Supersedes.....: 9/06/96

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**CONTAINMENT:** Safely stop discharge. Contain material, as necessary, with a dike or barrier. Stop material from contaminating soil, or from entering sewers or bodies of water.

**CLEAN-UP/PERSONAL PROTECTION EQUIPMENT:** Appropriate safety measures and protective equipment should be used. Use supplied air respirator or self-contained breathing apparatus in enclosed spaces or if airborne exposure limits can be exceeded. See Section 8.

**COLLECTION AND DISPOSAL:** Stop discharge, if safe to do so. Use proper protective equipment. Use non-sparking tools and/or explosion-proof equipment. Stop ignition sources. Cover spills with absorbent clay or sawdust and place in closed chemical waste containers. Dispose of according to applicable local, state and federal regulations.

**REPORTING:** Spills of this material in excess of a components's RQ must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.

Butyl alcohol, n-	RQ = 5000 LB
Xylene	RQ = 100 LB
Formaldehyde	RQ = 100 LB

## 7. HANDLING AND STORAGE

**STORAGE CONDITIONS:** Store in cool, dry, well ventilated area away from heat, ignition sources, and direct sunlight. Keep containers tightly closed.

**WARNING:** Hot organic chemical vapors or mists can suddenly and without warning combust when mixed with air. Ignition can occur at typical elevated temperature process conditions. Any use in such processes should be evaluated thoroughly to assure safe operating conditions.

**TRANSFER:** Containers should be supported and grounded before opening, dispensing, mixing, pouring, and emptying. Open with non-sparking tools. If container is warm, open bung slowly to release internal pressure.

**PERSONAL HYGIENE:** Wash thoroughly after handling, especially before eating, drinking, smoking, and using restroom facilities. Wash contaminated goggles, faceshield, and gloves. Professionally launder contaminated clothing before re-use.

**EMPTY CONTAINER PRECAUTIONS:** Attention! This container hazardous when empty. Follow label warnings even after container is emptied since empty containers may retain product residues. Do not use heat, sparks, open flames, torches, cigarettes on or near empty container. Do not reuse empty container without professional cleaning for food, clothing, or products for human or animal consumption or where skin contact can occur.

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379W25 H S WHITE POLYESTER  
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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

\*

EXPOSURE GUIDELINES:

ACGIH - TLV

Titanium Dioxide	10 mg/M3
1,2,4-trimethylbenzene	25 ppm
Butyl alcohol, n-	50 ppm - Skin
Trimethyl benzene	25 ppm
Silica, amorphous	10 mg/M3 Total dust
Xylene	100 ppm
Formaldehyde	0.3 ppm

ACGIH - STEL

Xylene	150 ppm
Formaldehyde	2 ppm

Manufacturer's PEL/TLV

Heavy aromatic solvent naphtha	100 ppm
Light aromatic solvent naphtha (C8-C10)	50 ppm
Ethyl beta-ethoxypropionate	50 ppm

Manufacturer's STEL

Ethyl beta-ethoxypropionate	100 ppm
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OSHA - PEL

Titanium Dioxide	10 mg/M3
Butyl alcohol, n-	50 ppm - Skin
Trimethyl benzene	25 ppm
Silica, amorphous	6 mg/M3 Total dust
Xylene	100 ppm
Formaldehyde	0.75 ppm

OSHA - STEL

Xylene	150 ppm
Formaldehyde	2 ppm

ENGINEERING CONTROLS/VENTILATION: Local exhaust ventilation is recommended when vapors, mists, or dusts can be released in excess of established airborne exposure limits (TLVs or PELs).

EYE PROTECTION: Wear chemical splash goggles. An eye wash facility should be readily available.

SKIN PROTECTION: Wear protective clothing and appropriate impervious gloves. Because a variety of protective gloves exist, consult glove manufacturer to determine the proper type for a specific operation.

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RESPIRATORY PROTECTION: Avoid breathing vapor and/or mists. Industrial hygiene consultation is recommended because airborne exposure levels vary depending on the nature of the operation performed. Wear NIOSH/MSHA-approved equipment. Determine the appropriate type by consulting the respirator manufacturer. High airborne concentrations may necessitate the use of self-contained breathing apparatus (SCBA) or a supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR 1910.134.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance.....: See Section 1	Odor.....: Solvent
Physical State: Liquid	Solubility....: Insoluble
pH.....: Not Applicable	Vapor Density.: > 1 Air = 1
Evaporation Rt: < 1 (Butyl acetate)	VOC Material...: Not Applicable
Specific Grvty: 1.48	%Non-Vol(w/w)..: 77.2
%Volatile(v/v): 38.2	Wt(lbs)/gal....: 12.3

NOTE: The physical data presented above are typical values and should not be construed as a specification.

ADDITIONAL INFORMATION: VOC content is being expressed as mass of VOC per unit volume of coating less water, where applicable. Theoretical VOC, determined by EPA method 24 equation.

## 10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions of use.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: High temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS: Oxidizers. Strong bases.

## 11. TOXICITY INFORMATION

### COMPONENTS:

#### Titanium Dioxide:

In a 2-year study in rats, an increase in benign and malignant lung tumors was observed at 250 mg/M3 respirable dust level. This level is 50 times the current occupational exposure level and is not expected to correlate to human exposures.

#### Heavy aromatic solvent naphtha:

Eye, skin, and respiratory tract irritant.

#### Polymer:

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May cause transient irritation to eyes and/or skin.

Light aromatic solvent naphtha (C8-C10):  
Eye, skin, and respiratory tract irritant.

1,2,4-trimethylbenzene:

Oral LD50	Rat	5 g/Kg
Inhalation LC50	Rat	18 g/M3/4-Hours

Butyl alcohol, n-:

Can cause liver and kidney injury. Prolonged inhalation has caused auditory nerve and vestibular injury resulting in severe vertigo and hearing loss in workers exposed to isobutyl and n-butyl alcohols.

Oral LD50	Rat	790 mg/kg
	Rabbit	3,484 mg/kg
Dermal LD50	Rabbit	3,400 mg/kg
Inhalation LC50	Rat	8,000 ppm/4-Hours

Trimethyl benzene:

Eye, skin, and respiratory tract irritant. Can cause liver and kidney injury.

Oral LD50	Rat	8,970 mg/kg
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Silica, amorphous:

Repeated exposure to dusts can lead to particulate deposition in the lungs (i.e., pneumoconiosis).

Oral LD50	Rat	> 3,000 mg/kg
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Ethyl beta-ethoxypropionate:

Oral LD50	Rat - Male	> 5,000 mg/kg
	Rat - Female	4,300 mg/kg
Dermal LD50	Guinea pig	> 20 ml/Kg
	Rabbit	10,000 mg/kg
Inhalation LC50	Rat	> 1000 ppm/6-hrs.

Xylene:

Oral LD50	Rat	4,300 mg/kg
Inhalation LC50	Rat	5,000 ppm/4-Hours

Formaldehyde:

Severely irritating to the eyes, skin, and respiratory tract. Causes skin and respiratory sensitization. Repeated exposure induced nasal cavity squamous cell carcinomas in rats. Formaldehyde has been found to be genotoxic in several assays and has shown the properties of both an initiator and a promotor.

Oral LD50	Rat	800 mg/kg
	Mouse	42 mg/kg
	Guinea pig	260 mg/kg
Dermal LD50	Rabbit	270 mg/kg



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Inhalation LC50	Rat	590 mg/M3
	Mouse	400 mg/M3/2-Hours

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12. ECOLOGICAL INFORMATION

No data are available on this product.

13. DISPOSAL CONSIDERATIONS

DISPOSAL: When a decision is made to discard this material as supplied, it meets RCRA's characteristic definition of ignitability. The toxicity characteristic (TC) has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).

GENERAL STATEMENTS: Federal regulations may apply to empty container. State and/or local regulations may be different.

GENERAL RECOMMENDATIONS: Of the methods of disposal currently available, it is recommended that an alternative be selected according to the following order of preference, based upon environmental acceptability: (1) recycle or rework, if feasible; (2) incinerate at an authorized facility; or (3) treat at an acceptable waste treatment facility.

SPECIAL INSTRUCTIONS: Be sure to contact the appropriate government environmental agencies if further guidance is required.

14. TRANSPORT INFORMATION

Weight (lb)	Shipping Name	49 CFR IATA IMO
	Paint Related Material	Y    Y

DOT Label.....: Flammable Liquid      UN/NA Id Num...: UN1263  
DOT Label No...: Not Applicable  
Hazard Class...: 3 (IATA/49CFR)  
Packing Group...: III

15. REGULATORY INFORMATION

FEDERAL:

This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SARA Title III - Section 311/312 - Hazard Categories:

Y- Fire Hazard  
N- Sudden Release of Pressure Hazard  
N- Reactivity Hazard  
Y- Immediate (acute) Health Hazard  
Y- Delayed (chronic) Health Hazard

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Ozone-Depleting Chemicals - No regulated ingredients.

SARA Section 302 Extremely Hazardous Mat  
Formaldehyde

SARA Section 313 Toxic Chemicals  
1,2,4-trimethylbenzene  
Butyl alcohol, n-  
Xylene  
Formaldehyde

STATE RIGHT-TO-KNOW:

Pennsylvania - New Jersey R-T-K

Titanium Dioxide	13463-67-7	36.3
Heavy aromatic solvent naphtha	64742-94-5	6.7
Polymer	Proprietary	5.2
Light aromatic solvent naphtha (C8-C10)	64742-95-6	3.6
1,2,4-trimethylbenzene	95-63-6	2.9
Environmental Hazard.		
Butyl alcohol, n-	71-36-3	2.4
Environmental Hazard.		
Trimethyl benzene	25551-13-7	2.1
Silica, amorphous	7631-86-9	2.0
ethyl beta-ethoxypropionate	763-69-9	1.7
Xylene	1330-20-7	1.3
Environmental Hazard.		
Formaldehyde	50-00-0	< 0.1
Environmental and Special Hazard.		
Non-hazardous trade secret ingredient(s)	Proprietary	Balance

California - California Proposition 65

WARNING: This product contains a chemical(s) known to the State of California to cause cancer and birth defects or other reproductive harm.

Toluene	108-88-3	< 0.1
Reproductive Hazard.		
Formaldehyde	50-00-0	< 0.1
Cancer Hazard.		

\* Trace = present at less than 0.01 percent.

CONEG - No data available.

CANADA:

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS).

Class B Division 2

Class D Division 2 Sub-division A

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Effective.....: 9/06/96      Supersedes.....: 9/06/96

Ozone-Depleting Chemicals - No regulated ingredients.

SARA Section 302 Extremely Hazardous Mat  
Formaldehyde

SARA Section 313 Toxic Chemicals  
1,2,4-trimethylbenzene  
Butyl alcohol, n-  
Xylene  
Formaldehyde

STATE RIGHT-TO-KNOW:

Pennsylvania - New Jersey R-T-K

Titanium Dioxide	13463-67-7	36.3
Heavy aromatic solvent naphtha	64742-94-5	6.7
Polymer	Proprietary	5.2
Light aromatic solvent naphtha (C8-C10)	64742-95-6	3.6
1,2,4-trimethylbenzene	95-63-6	2.9
Environmental Hazard.		
Butyl alcohol, n-	71-36-3	2.4
Environmental Hazard.		
Trimethyl benzene	25551-13-7	2.1
Silica, amorphous	7631-86-9	2.0
ethyl beta-ethoxypropionate	763-69-9	1.7
Xylene	1330-20-7	1.3
Environmental Hazard.		
Formaldehyde	50-00-0	< 0.1
Environmental and Special Hazard.		
Non-hazardous trade secret ingredient(s)	Proprietary	Balance

California - California Proposition 65

WARNING: This product contains a chemical(s) known to the State of California to cause cancer and birth defects or other reproductive harm.

Toluene	108-88-3	< 0.1
Reproductive Hazard.		
Formaldehyde	50-00-0	< 0.1
Cancer Hazard.		

\* Trace = present at less than 0.01 percent.

CONEG - No data available.

CANADA:

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS).

Class B Division 2

Class D Division 2 Sub-division A

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Class D Division 2 Sub-division B

CEPA - NPRI  
1,2,4-trimethylbenzene  
Butyl alcohol, n-  
Xylene

16. OTHER INFORMATION \*

USERS RESPONSIBILITY: A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information herein should be passed on to your customers or employees, as the case may be.

DISCLAIMER OF LIABILITY: The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular use or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

End of Material Safety Data Sheet \*

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## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION \*

Product ID: 379W141

Generic Description: Colored Liquid

Product Use: Coating

For customer service/technical information, contact:

Morton Industrial Coatings

Haynes Circle

Chicopee MA 01020

413-592-4191

MSDS prepared by:

Toxicology and Regulated Substance Compliance

David Wienckowski, D.A.B.T.

100 N. Riverside Plaza

Chicago IL 60606

312-807-3422

ChemTrec Emergency

1-800-424-9300

Hazard Ratings HMIS NFPA \* = Chronic

Health 2 \* 2

Fire 3 3

Reactivity 0 0

## 2. COMPOSITION/INFORMATION ON INGREDIENTS \*

COMMON NAME	CAS #	Approximate % (w/w)
Titanium Dioxide	13463-67-7	35.7
Heavy aromatic solvent naphtha	64742-94-5	10.3
Polymer	Proprietary	5.1
Light aromatic solvent naphtha (C8-C10)	64742-95-6	4.7
Diethylene glycol monobutyl ether acetate	124-17-4	4.1
Silica, amorphous	7631-86-9	2.0
Ethyl beta-ethoxypropionate	763-69-9	1.7
Naphthalene	91-20-3	1.2
Ethylene glycol monobutyl ether	111-76-2	1.1
1,2,4-trimethylbenzene	95-63-6	0.2
Formaldehyde	50-00-0	< 0.1
Non-hazardous and other ingredients below reportable levels	Proprietary	Balance

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**3. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW:** FLAMMABLE LIQUID AND VAPOR. MAY CAUSE ALLERGIC SKIN REACTION AND SENSITIZATION. CAUSES SEVERE EYE IRRITATION. INHALATION MAY CAUSE DIZZINESS, HEADACHE AND INCOORDINATION. INGESTION CAN CAUSE DIZZINESS, FAINTNESS, HEADACHE AND INCOORDINATION. INGESTION MAY CAUSE INFLAMMATION OF THE LUNGS. MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE DIGESTIVE TRACT IRRITATION. INGESTION MAY CAUSE NAUSEA, VOMITING, PAIN, UPSET STOMACH, DIARRHEA. INHALATION MAY CAUSE NAUSEA, VOMITING, UPSET STOMACH. MAY CAUSE SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. See sections 3, 5, & 6.

**PRIMARY ROUTES OF EXPOSURE:** Eye. Skin. Inhalation (breathing).

**EYE CONTACT:** Causes severe irritation. Can cause burning sensation, tearing, and redness.

**SKIN CONTACT:** Prolonged or repeated contact may dry the skin and lead to irritation (i.e. dermatitis). May cause slight to mild irritation. May be harmful if absorbed through the skin. May cause allergic skin reactions and sensitization.

**INHALATION (Breathing):** Irritating to the eyes, nose, and respiratory tract. Can cause wheezing, coughing, shortness of breath, and tightness in the chest. Can cause dizziness, headaches, and incoordination. Nausea, vomiting, and stomach upset can occur. Can cause anesthetic and/or narcotic effects.

**INGESTION (Swallowing):** Irritating to the mouth, throat, and stomach. May be harmful if swallowed. May cause nausea, vomiting, pain, and stomach upset (e.g., diarrhea). Can cause dizziness, faintness, headache, and incoordination. Possible aspiration hazard. May cause inflammation of the lungs.

**TARGET ORGANS/CHRONIC EFFECTS:** Lungs and respiratory system. Eyes. Skin. Immune system (e.g, allergic reactions). Nervous system. Kidneys. Liver.

**CONDITIONS AGGRAVATED BY EXPOSURE:** Lungs and respiratory system. Skin. Immune systems and/or specific chemical allergies. Kidneys. Liver.

**CARCINOGENICITY:**

	ACGIH	IARC	NTP	OSHA
Titanium Dioxide	No	No	No	No
Heavy aromatic solvent naphtha	No	No	No	No
Polymer	No	No	No	No
Light aromatic solvent naphtha (C8-C10)	No	No	No	No
Diethylene glycol monobutyl ether acetate	No	No	No	No
Silica, amorphous	No	No	No	No
Ethyl beta-ethoxypropionate	No	No	No	No
Naphthalene	No	No	No	No

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Ethylene glycol monobutyl ether	No	No	No	No
1,2,4-trimethylbenzene	No	No	No	No
Formaldehyde	A2	2A	Yes	Yes

## 4. FIRST AID MEASURES \*

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Get prompt medical attention.

**SKIN CONTACT:** Immediately flush with water. Remove contaminated clothing and shoes. Get medical attention if irritation persists. Professionally wash clothing and shoes before re-use.

**INHALATION (Breathing):** Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration.

**INGESTION (Swallowing):** Seek medical attention. Immediately induce vomiting, as directed by medical personnel. Never give anything by mouth to an unconscious person.

**NOTES TO PHYSICIANS:** Treatment should be directed at preventing absorption, administering to symptoms (if they occur), and providing supportive therapy.

## 5. FIRE FIGHTING METHODS \*

**Flash Point...:** 85F 29.4C      **Method.....:** Tagliabue Closed Cup  
**Explosive Lmts:** LEL(%) Not Determined UEL(%) Not Determined  
**Autoignition...:** Not Determined

**HAZARDOUS COMBUSTION AND DECOMPOSITION PRODUCTS:** Smoke, soot, and toxic/irritating fumes (i.e., carbon dioxide, carbon monoxide, etc.). Oxides of nitrogen.

**FIRE AND EXPLOSION HAZARDS:** High temperatures can cause sealed containers to rupture due to a build up of internal pressure. Cool with water. Vapors can travel to a source of ignition (flame, electric motor, hot surface, cigarette, etc.) and flash back. During a fire, irritating and highly toxic gases may be generated during combustion or decomposition.

**EXTINGUISHING MEDIA:** **SMALL FIRES:** Dry chemical, carbon dioxide, halon, water spray, or foam. **LARGE FIRES:** Water spray, fog, or alcohol foam.

**FIRE FIGHTING PROCEDURES/EQUIPMENT:** Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH-approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.

## 6. ACCIDENTAL RELEASE MEASURES \*

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**EVACUATION:** Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Eliminate all sources of ignition.

**CONTAINMENT:** Safely stop discharge. Contain material, as necessary, with a dike or barrier. Stop material from contaminating soil, or from entering sewers or bodies of water.

**CLEAN-UP/PERSONAL PROTECTION EQUIPMENT:** Appropriate safety measures and protective equipment should be used. Use supplied air respirator or self-contained breathing apparatus in enclosed spaces or if airborne exposure limits can be exceeded. See Section 8.

**COLLECTION AND DISPOSAL:** Stop discharge, if safe to do so. Use proper protective equipment. Use non-sparking tools and/or explosion-proof equipment. Stop ignition sources. Cover spills with absorbent clay or sawdust and place in closed chemical waste containers. Dispose of according to applicable local, state and federal regulations.

**REPORTING:** Spills of this material in excess of a component's RQ must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.

Formaldehyde

RQ = 100 LB

## 7. HANDLING AND STORAGE

**STORAGE CONDITIONS:** Store in cool, dry, well ventilated area away from heat, ignition sources, and direct sunlight. Keep containers tightly closed.

**WARNING:** Hot organic chemical vapors or mists can suddenly and without warning combust when mixed with air. Ignition can occur at typical elevated temperature process conditions. Any use in such processes should be evaluated thoroughly to assure safe operating conditions.

**TRANSFER:** Containers should be supported and grounded before opening, dispensing, mixing, pouring, and emptying. Open with non-sparking tools. If container is warm, open bung slowly to release internal pressure.

**PERSONAL HYGIENE:** Wash thoroughly after handling, especially before eating, drinking, smoking, and using restroom facilities. Wash contaminated goggles, faceshield, and gloves. Professionally launder contaminated clothing before re-use.

**EMPTY CONTAINER PRECAUTIONS:** Attention! This container hazardous when empty. Follow label warnings even after container is emptied since empty containers may retain product residues. Do not use heat, sparks, open flames, torches, cigarettes on or near empty container. Do not reuse empty container without professional cleaning for food, clothing, or products for human or animal consumption or where skin contact can occur.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION \*

## EXPOSURE GUIDELINES:

## ACGIH - TLV

Titanium Dioxide	10 mg/M3
Silica, amorphous	10 mg/M3 Total dust
Naphthalene	10 ppm
Ethylene glycol monobutyl ether	25 ppm - Skin
1,2,4-trimethylbenzene	25 ppm
Formaldehyde	0.3 ppm

## ACGIH - STEL

Naphthalene	15 ppm
Formaldehyde	2 ppm

## Manufacturer's PEL/TLV

Heavy aromatic solvent naphtha	100 ppm
Light aromatic solvent naphtha (C8-C10)	50 ppm
Ethyl beta-ethoxypropionate	50 ppm

## Manufacturer's STEL

Ethyl beta-ethoxypropionate	100 ppm
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## OSHA - PEL

Titanium Dioxide	10 mg/M3
Silica, amorphous	6 mg/M3 Total dust
Naphthalene	10 ppm
Ethylene glycol monobutyl ether	25 ppm - Skin
Formaldehyde	0.75 ppm

## OSHA - STEL

Naphthalene	15 ppm
Formaldehyde	2 ppm

ENGINEERING CONTROLS/VENTILATION: Local exhaust ventilation is recommended when vapors, mists, or dusts can be released in excess of established airborne exposure limits (TLVs or PELs).

EYE PROTECTION: Wear chemical splash goggles. An eye wash facility should be readily available.

SKIN PROTECTION: Wear rubber boots and apron, protective clothing, and impervious gloves. Because a variety of protective gloves exist, consult glove manufacturer to determine the proper type for a specific operation.

RESPIRATORY PROTECTION: Avoid breathing vapor and/or mists. Industrial

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hygiene consultation is recommended because airborne exposure levels vary depending on the nature of the operation performed. Wear NIOSH/MSHA-approved equipment. Determine the appropriate type by consulting the respirator manufacturer. High airborne concentrations may necessitate the use of self-contained breathing apparatus (SCBA) or a supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR 1910.134.

## 9. PHYSICAL AND CHEMICAL PROPERTIES \*

Appearance....: See Section 1	Odor.....: Solvent
Physical State: Liquid	Solubility....: Insoluble
pH.....: Not Applicable	Vapor Density.: > 1 Air = 1
Evaporation Rt: < 1 (Butyl acetate)	VOC Material...: Not Applicable
Specific Grvty: 1.476	%Non-Vol(w/w)..: 75.5
%Volatile(v/v): 40	Wt(lbs)/gal....: 12.3

NOTE: The physical data presented above are typical values and should not be construed as a specification.

ADDITIONAL INFORMATION: VOC content is being expressed as mass of VOC per unit volume of coating less water, where applicable.

## 10. STABILITY AND REACTIVITY \*

CHEMICAL STABILITY: Stable under normal conditions of use.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: High temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS: Oxidizers. Strong bases.

## 11. TOXICITY INFORMATION \*

## COMPONENTS:

## Titanium Dioxide:

In a 2-year study in rats, an increase in benign and malignant lung tumors was observed at 250 mg/M3 respirable dust level. This level is 50 times the current occupational exposure level and is not expected to correlate to human exposures.

## Heavy aromatic solvent naphtha:

Eye, skin, and respiratory tract irritant.

## Polymer:

May cause transient irritation to eyes and/or skin.

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Light aromatic solvent naphtha (C8-C10):  
Eye, skin, and respiratory tract irritant.

Diethylene glycol monobutyl ether acetate:

Oral LD50	Rat	6,500 mg/kg
	Rabbit	2,260 mg/kg
	Mouse	6,600 mg/kg
Dermal LD50	Rabbit	14,500 mg/kg

Silica, amorphous:

Repeated exposure to dusts can lead to particulate deposition in the lungs  
(i.e., pneumoconiosis).

Oral LD50	Rat	> 3,000 mg/kg
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Ethyl beta-ethoxypropionate:

Oral LD50	Rat - Male	> 5,000 mg/kg
	Rat - Female	4,300 mg/kg
Dermal LD50	Guinea pig	> 20 ml/Kg
	Rabbit	10,000 mg/kg
Inhalation LC50	Rat	> 1000 ppm/6-hrs.

Naphthalene:

Can cause liver and kidney injury. Causes severe eye irritation.

Oral LD50	Rat	490 mg/kg
	Guinea pig	1,200 mg/kg
	Mouse	533 mg/kg
Dermal LD50	Rat	> 2,500 mg/kg
	Rabbit	> 20 g/Kg

Ethylene glycol monobutyl ether:

May affect the liver and kidneys and may increase red blood cell fragility.

Oral LD50	Rat	470 mg/kg
	Mouse	1,230 mg/kg
	Rabbit	300 mg/kg
Dermal LD50	Rabbit	220 mg/kg
	Guinea pig	230 mg/kg
Inhalation LC50	Mouse	700 ppm/7-Hours
	Rat	2,900 mg/M3

1,2,4-trimethylbenzene:

Oral LD50	Rat	5 g/Kg
Inhalation LC50	Rat	18 g/M3/4-Hours

Formaldehyde:

Severely irritating to the eyes, skin, and respiratory tract. Causes skin and respiratory sensitization. Repeated exposure induced nasal cavity squamous cell carcinomas in rats. Formaldehyde has been found to be genotoxic in several assays and has shown the properties of both an initiator and a

---

Morton International, Inc., 100 North Riverside Plaza, Chicago, IL 60606-1598  
312/807-2000

MSDS Number....: 70638-1-1

379W141

Effective: 4/10/97 Supersedes: 4/10/97

## promotor.

Oral LD50	Rat	800 mg/kg
	Mouse	42 mg/kg
Dermal LD50	Guinea pig	260 mg/kg
	Rabbit	270 mg/kg
Inhalation LC50	Rat	590 mg/M3
	Mouse	400 mg/M3/2-Hours

## 12. ECOLOGICAL INFORMATION

No data are available on this product. \*

## 13. DISPOSAL CONSIDERATIONS \*

DISPOSAL: When a decision is made to discard this material as supplied, it meets RCRA's characteristic definition of ignitability. The toxicity characteristic (TC) has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).

GENERAL STATEMENTS: Federal regulations may apply to empty container. State and/or local regulations may be different.

GENERAL RECOMMENDATIONS: Of the methods of disposal currently available, it is recommended that an alternative be selected according to the following order of preference, based upon environmental acceptability: (1) recycle or rework, if feasible; (2) incinerate at an authorized facility; or (3) treat at an acceptable waste treatment facility.

SPECIAL INSTRUCTIONS: Be sure to contact the appropriate government environmental agencies if further guidance is required.

## 14. TRANSPORT INFORMATION \*

Weight (lb)	Shipping Name	49 CFR IATA IMO
	Paint Related Material	Y Y

DOT Label.....: Flammable Liquid UN/NA Id Num.: UN1263  
DOT Label No.: Not Applicable  
Hazard Class...: 3 (IATA/49CFR)  
Packing Group.: III

## 15. REGULATORY INFORMATION \*

## FEDERAL:

This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SARA Title III - Section 311/312 - Hazard Categories:

Morton International, Inc., 100 North Riverside Plaza, Chicago, IL 60606-1598  
312/807-2000

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379W141

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Y- Fire Hazard  
N- Sudden Release of Pressure Hazard  
N- Reactivity Hazard  
Y- Immediate (acute) Health Hazard  
Y- Delayed (chronic) Health Hazard

Ozone-Depleting Chemicals - No regulated ingredients.

SARA Section 302 Extremely Hazardous Mat  
FormaldehydeSARA Section 313 Toxic Chemicals  
Diethylene glycol monobutyl ether acetate  
Glycol ethersNaphthalene  
Ethylene glycol monobutyl ether  
Glycol ethers1,2,4-trimethylbenzene  
FormaldehydeTSCA Section 12(b) Export Notification  
Diethylene glycol monobutyl ether acetateTSCA Section 8(d) Data Reporting Rule  
Naphthalene  
Ethylene glycol monobutyl ether

## STATE RIGHT-TO-KNOW:

## Pennsylvania - New Jersey R-T-K

Titanium Dioxide	13463-67-7	35.7
Heavy aromatic solvent naphtha	64742-94-5	10.3
Polymer	Proprietary	5.1
Light aromatic solvent naphtha (C8-C10)	64742-95-6	4.7
Diethylene glycol monobutyl ether acetate	124-17-4	4.1
Silica, amorphous	7631-86-9	2.0
Ethyl beta-ethoxypropionate	763-69-9	1.7
Naphthalene	91-20-3	1.2
Ethylene glycol monobutyl ether	111-76-2	1.1
1,2,4-trimethylbenzene	95-63-6	0.2
Environmental Hazard.		
Formaldehyde	50-00-0	< 0.1
Environmental and Special Hazard.		
Non-hazardous trade secret ingredient(s)	Proprietary	Balance

## California - California Proposition 65

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

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Morton International, Inc., 100 North Riverside Plaza, Chicago, IL 60606-1598  
312/807-2000

MSDS Number....: 70638-1-1

379W141

Effective: 4/10/97 Supersedes: 4/10/97

Formaldehyde

50-00-0 &lt; 0.1

Cancer Hazard.

\* Trace = present at less than 0.01 percent.

CONEG - No data available.

## CANADA:

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS).

Class B Division 2

Class D Division 2 Sub-division A

Class D Division 2 Sub-division B

CEPA - NPRI

Naphthalene

## 16. OTHER INFORMATION \*

USERS RESPONSIBILITY: A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information herein should be passed on to your customers or employees, as the case may be.

DISCLAIMER OF LIABILITY: The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

End of Material Safety Data Sheet \*

Morton International, Inc., 100 North Riverside Plaza, Chicago, IL 60606-1598  
312/807-2000



# PETRO PRODUCTS, INC.

670 NORTH CLARK STREET  
CHICAGO, ILLINOIS 60610  
(312) 751-0665 FAX: (312) 751-2357

## INDUSTRIAL CHEMICALS

### 100 SOLVENT MATERIAL SAFETY DATA SHEET

PAGE 1

REVISION DATE: 6/9/88

THIS MSDS IS BEING PROVIDED TO YOUR COMPANY FOR THE PURPOSE OF PROVIDING CURRENT HEALTH AND SAFETY INFORMATION TO YOUR MANAGEMENT AND FOR YOUR EMPLOYEES WHO WORK WITH THIS MATERIAL. PLEASE READ THE INFORMATION ON THESE SHEETS, AND THEN PROVIDE THIS INFORMATION TO THOSE PEOPLE AT YOUR COMPANY WHOSE RESPONSIBILITY IT IS TO COMPLY WITH FEDERAL AND STATE RIGHT TO KNOW REGULATIONS. ALSO MAKE THIS INFORMATION AVAILABLE TO ANY EMPLOYEE WHO REQUESTS IT.

IT IS YOUR OBLIGATION TO COMPLY WITH THIS ACT.

#### SECTION I - PRODUCT IDENTIFICATION

\*\*\*\*\*  
\* PRODUCER'S NAME: VARIOUS \*  
\* DISTRIBUTED BY PETRO PRODUCTS INC. \*  
\* 670 N. CLARK STREET \*  
\* ADDRESS: CHICAGO, IL 60610 \*  
\* REGULAR PHONE NUMBER: (312)751-0665 \*  
\* EMERGENCY TELEPHONE NUMBER: (312)751-0665 \*  
\* (800)424-9300 CHEMTREC \*  
\* CHEMICAL NAME AND SYNONYMS: AROMATIC PETROLEUM SOLVENT \*  
\* CHEMICAL FAMILY: PETROLEUM HYDROCARBON \*  
\* TRADE NAME AND SYNONYMS: AROMATIC 100 SOLVENT, \*  
\* FORMULA: COMPLEX MIXTURE OF PETROLEUM HYDROCARBONS \*  
\* HAZARD CLASSIFICATION: PETROLEUM NAPHTHA-COMBUSTIBLE LIQUID \*  
\* UN 1255 \*  
\*\*\*\*\*

#### SECTION II - HAZARDOUS COMPONENTS

\*\*\*\*\*  
\* INGREDIENT PERCENT PEL\* TLV\*\* \*  
\* ----- \*  
\* AROMATIC 100 100% 50 PPM\* \*  
\* A HIGHLY REFINED HYDROCARBON SOLVENT THAT IS CLASSED \*  
\* AS A LIGHT AROMATIC SOLVENT NAPHTHA (PETROLEUM), \*  
\* CAS# 64742-95-6. THIS PRODUCT CONTAINS APPROXIMATELY \*  
\* 5% XYLENE. \*  
\* AVERAGE MOLECULAR WEIGHT = APPROX. 120. \*  
\* HEALTH STUDIES HAVE SHOWN THAT MANY PETROLEUM HYDROCARBONS \*  
\* POSE POTENTIAL HUMAN HEALTH RISKS WHICH MAY VARY FROM PERSON \*  
\* TO PERSON. AS A PRECAUTION, EXPOSURE TO LIQUIDS AND VAPORS OF \*  
\* PETROLEUM PRODUCTS SHOULD BE MINIMIZED. \*  
\* \*\*\*\*\*  
\* CONTINUED ON PAGE 2 \*\*\*\*\*

100 SOLVENT  
MATERIAL SAFETY DATA SHEET

PAGE 2

REVISION DATE: 8/9/88

SECTION II - HAZARDOUS COMPONENTS (CONTINUED)

EXPOSURE LIMIT FOR TOTAL PRODUCT: 50 PPM (245 MG/M3) FOR AN  
8-HOUR WORKDAY. BASIS RECOMMENDED BY EXXON.

SECTION III - PHYSICAL DATA - TYPICAL

INITIAL BOILING POINT (F): APPROXIMATELY 306-335 F (152-168 C)  
VAPOR PRESSURE: (MM HG) @ 25 C= < 10  
VAPOR DENSITY: (AIR=1): APPROX. 4.1  
SOLUBILITY IN WATER: NEGLIGIBLE.  
SPECIFIC GRAVITY: (H2O=1): 15.6/15.6 C= APPROX. 0.872  
PERCENT VOLATILES: 100% @ 1 ATM. AND 77 F (25 C)  
EVAPORATION RATE: (N-BUTYL ACETATE=1) APPROX. 0.2  
APPEARANCE AND ODOR: WATER-WHITE LIQUID WITH AROMATIC  
HYDROCARBON ODOR.

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT (TCC): APPROX. 106 F (41 C) TCC ASTM D 56  
AUTOIGNITION TEMPERATURE: APPROX. 580 F (471 C) ASTM D 2155  
COMBUSTIBLE- PER DOT 49 CFR 173.115  
FLAMMABLE LIMITS: LEL= 0.9%  
UEL= 7.0%  
EXTINGUISHING MEDIA: FOAM, WATER MIST OR SPRAY, DRY CHEMICAL AND CARBON  
DIOXIDE.  
SPECIAL FIREFIGHTING PROCEDURES: USE SUPPLIED-AIR BREATHING EQUIPMENT  
FOR ENCLOSED AREAS. COOL EXPOSED CONTAINERS WITH WATER SPRAY.  
MINIMIZE BREATHING OF VAPOR OR FUMES.  
UNUSUAL FIRE & EXPLOSION HAZARDS: DO NOT MIX OR STORE WITH STRONG  
OXIDANTS SUCH AS LIQUID CHLORINE OR CONCENTRATED OXYGEN.  
"EMPTY" PRODUCT CONTAINERS RETAIN PRODUCT RESIDUE. DO NOT  
PRESSURIZE, CUT, HEAT, WELD OR EXPOSE SUCH CONTAINERS TO FLAME;  
THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.  
COMBUSTIBLE LIQUID

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL: SEE SECTION 2.

CONTINUED ON PAGE 3



100 SOLVENT  
MATERIAL SAFETY DATA SHEET

PAGE 3

REVISION DATE: 5/9/88

SECTION V - HEALTH HAZARD DATA (CONTINUED)

RECOMMENDED EXPOSURE LIMIT IS 50 PPM FOR 8-HOUR WORKDAY.

EFFECTS OF OVER EXPOSURE: INHALATION OF HIGH VAPOR CONCENTRATIONS MAY HAVE RESULTS RANGING FROM DIZZINESS, HEADACHE AND RESPIRATORY IRRITATION TO UNCONSCIOUSNESS. PROLONGED OR REPEATED LIQUID CONTACT WITH THE SKIN WILL DRY AND DEFEAT THE SKIN, LEADING TO IRRITATION AND DERMATITIS. SEE SECTION II FOR ADDITIONAL HEALTH-EFFECTS INFORMATION.

EMERGENCY AND FIRST AID PROCEDURES: INHALATION- IF OVERCOME BY VAPORS, REMOVE FROM EXPOSURE IMMEDIATELY; CALL A PHYSICIAN. IF BREATHING IS IRREGULAR OR STOPPED, START RESUSCITATION, ADMINISTER OXYGEN. INGESTION- \*\*\*\*\*DO NOT INDUCE VOMITING\*\*\*\*\*  
CALL A PHYSICIAN.

SKIN- REMOVE ANY CONTAMINATED CLOTHING AND WASH SKIN WITH SOAP AND WARM WATER.

EYES- FLUSH EYES WITH CLEAR WATER FOR 15 MINUTES OR UNTIL IRRITATION SUBSIDES. IF IRRITATION PERSISTS, CALL A PHYSICIAN.

PRODUCT HAS A LOW ORDER OF ACUTE ORAL AND DERMAL TOXICITY, BUT MINUTE AMOUNTS ASPIRATED INTO THE LUNGS DURING INGESTION MAY CAUSE MILD TO SEVERE PULMONARY INJURY AND POSSIBLY DEATH.

SECTION VI - REACTIVITY DATA

STABILITY: STABLE.

INCOMPATIBILITY: STRONG OXIDANTS SUCH AS LIQUID CHLORINE, CONCENTRATED OXYGEN, SODIUM- OR CALCIUM HYPOCHLORITE.

HAZARDOUS DECOMPOSITION PRODUCTS: FUMES, SMOKE AND CARBON MONOXIDE, IN THE CASE OF INCOMPLETE COMBUSTION.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL POSSIBLE IGNITION SOURCES. AVOID BREATHING VAPORS. KEEP PEOPLE AWAY. RECOVER FREE LIQUID. ADD ABSORBENT (SAND, EARTH, SAWDUST, ETC.) TO SPILL AREA. VENTILATE CONFINED SPACES. OPEN ALL WINDOWS AND DOORS. KEEP PETROLEUM PRODUCTS OUT OF SEWERS AND WATERCOURSES BY DIKING OR IMPOUNDING. ADVISE AUTHORITIES IF PRODUCT HAS ENTERED OR MAY ENTER SEWERS, WATERCOURSES OR EXTENSIVE LAND AREAS. THIS PRODUCT IS SUBJECT TO REPORTABLE QUANTITIES (RQ) LISTING UNDER DOT REGULATION 49 CFR 171-177.

WASTE DISPOSAL METHOD: CONTACT STATE, LOCAL AND FEDERAL AGENCIES TO ENSURE COMPLIANCE OF DISPOSAL METHOD WITH CURRENT REGULATIONS. DISPOSE OF ABSORBED MATERIAL AT AN APPROVED DISPOSAL SITE OR FACILITY. CONTINUE TO OBSERVE PRECAUTIONS FOR VOLATILE, COMBUSTIBLE VAPORS FROM ABSORBED MATERIAL. AROMATIC 100 CONTAINS APPROXIMATELY 4% XYLENE, EPA HAZARDOUS WASTE NO. U239 (40 CFR 261).

CONTINUED ON PAGE 4

100 SOLVENT  
MATERIAL SAFETY DATA SHEET

PAGE 4

REVISION DATE: 6/9/83

SECTION VIII - PROTECTIVE EQUIPMENT TO BE USED

\*\*\*\*\*  
\* RESPIRATORY PROTECTION: USE SUPPLIED-AIR RESPIRATORY PROTECTION  
\* IN CONFINED OR ENCLOSED SPACES, IF NEEDED.  
\*  
\* VENTILATION: (LOCAL EXHAUST): FACE VELOCITY > 60 FPM. (SPECIAL) : USE  
\* ONLY WITH ADEQUATE VENTILATION. \* (MECHANICAL-GENERAL) : USE  
\* EXPLOSION-PROOF EQUIPMENT. (OTHER) : AVOID POTENTIAL IGNITION  
\* SOURCES. NO SMOKING OR OPEN LIGHTS.  
\*  
\* PROTECTIVE GLOVES: USE CHEMICAL RESISTANT GLOVES, IF NEEDED, TO AVOID  
\* REPEATED OR PROLONGED SKIN CONTACT.  
\*  
\* EYE PROTECTION: USE SPLASH GOGGLES OR FACE SHIELD WHEN EYE CONTACT  
\* MAY OCCUR.  
\*  
\* OTHER PROTECTIVE EQUIPMENT: USE CHEMICAL-RESISTANT APRON OR OTHER  
\* CLOTHING, IF NEEDED, TO AVOID REPEATED OR PROLONGED SKIN  
\* CONTACT.  
\*  
\* \*- ADEQUATE MEANS SUFFICIENT TO PREVENT BUILD-UP OF TOXIC OR  
\* EXPLOSIVE CONCENTRATIONS OF VAPOR IN AIR.  
\*  
\*\*\*\*\*

SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS

\*\*\*\*\*  
\* PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP CONTAINERS  
\* CLOSED WHEN NOT IN USE. DO NOT HANDLE OR STORE NEAR HEAT, SPARKS,  
\* FLAME OR STRONG OXIDANTS. ADEQUATE VENTILATION REQUIRED. ( MEANS  
\* SUFFICIENT TO PREVENT BUILD UP OF TOXIC OR EXPLOSIVE CONCENTRATIONS  
\* OF VAPOR IN AIR.  
\*  
\* OTHER PRECAUTIONS: MINIMIZE BREATHING VAPORS. AVOID PROLONGED OR  
\* REPEATED CONTACT WITH SKIN. REMOVE CONTAMINATED CLOTHING, LAUNDER  
\* BEFORE REUSE. REMOVE CONTAMINATED SHOES AND THOROUGHLY DRY BEFORE  
\* REUSE. WASH SKIN THOROUGHLY WITH SOAP AND WATER AFTER CONTACT,  
\* BEFORE BREAKS AND MEALS, AND AT END OF WORK PERIOD.  
\*  
\* THE FOLLOWING CHEMICALS MAY BE SUBJECT TO REPORTING UNDER SEC. 313  
\* OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT  
\* OF 1980 AND 40 CFR PART 372.  
\*  
\* 1,2,4-TRIMETHYLBENZENE CAS# 95-63-6 21 WT%  
\*  
\* DATE ENTERED: 06/03/85  
\*  
\* REVISION DATE: 6/9/85  
\*  
\*\*\*\*\*

The information provided in this Material Safety Data Sheet has been obtained from sources believed to be reliable. The manufacturer and distributor provide no warranties, either expressed or implied, and assume no responsibility for the accuracy or completeness of the data contained herein. This information is offered for your information consideration and investigation. You should satisfy yourself that you have all current data relevant to your particular use.

## MATERIAL SAFETY DATA SHEET

FOR COATING, RESINS, AND RELATED MATERIALS

For:

Prepared by: John P. Koch  
Date Prepared- 11-06-95  
Manufacturer: WATSON-STANDARD CO.  
Address: P.O. Box 11250  
Pittsburgh, PA 15328

Telephone#: (412) 362-8300 Night and Emergency (800) 424-9300  
MSDS Last Prepared: NONE

-----  
SECTION I PRODUCT IDENTIFICATION  
-----

Manufacturer's Code Identification: 20-136-CF Revision  
Product Class:  
Trade Name: CLEAR COATING  
HMIS Information: Health- 2 Flammability- 3  
Reactivity- 1 Personal Protective Equipment- H  
-----  
Splash Goggles, Gloves, Synthetic Apron, & Vapor Respirator  
-----

SECTION II HAZARDOUS INGREDIENTS  
-----

2-ETHOXYETHANOL  
( BUTYL CELLOSOLVE CAS# 111-76-2  
% BY WT: 11.501 VAPOR PRESSURE: .60 MMHG @ 68F LEL: 1.1

EXPOSURE LIMIT:  
ACGIH-TLV 25.0 PPM (SKIN)  
OSHA-PEL 25.0 PPM (SKIN)  
OTHER 50.0 PPM

OTHER LIMITS:  
EXPERIMENTAL: TERATOGEN, REPRO EFFECTS.

DIACETONE ALCOHOL  
02 2-METHYL-2-PENTANOL-4ONE CAS# 123-42-2  
% BY WT: 5 - 10 VAPOR PRESSURE: .81 MMHG @ 68F LEL: 1.8

EXPOSURE LIMIT:  
ACGIH-TLV 50.0 PPM/8H  
-----

N-BUTYL ALCOHOL  
03 1-BUTANOL CAS# 71-36-3  
% BY WT: 12.011 VAPOR PRESSURE: 5.50 MMHG @ 68F LEL: 1.4

EXPOSURE LIMIT:  
ACGIH-TLV 50.0 PPM (SKIN)  
MAK/TRK (Germany) 100 PPM  
BAT (Germany) NONE

OTHER LIMITS:  
MUTAGEN DATA.

SAMPLE TEST

\*\*\*\*\*

\*\*\*\*\*

-----  
SECTION II HAZARDOUS INGREDIENTS  
-----

-----  
PSEUDOCUMENE

04

CAS# 95-63-6

% BY WT: 1.350

EXPOSURE LIMIT:

OSHA-PEL

25 PPM, 125 MG/M3

OTHER

LD (IP) RATS 2.0 ML/KG  
-----

SOLVesso 100

05 AROMATIC 100

CAS# 64742-95-6

% BY WT: .5 - 5

VAPOR PRESSURE:

8.50 MMHG @ 68F LEL: .9

EXPOSURE LIMIT:

-----  
XYLENE

06 DIMETHYLBENZENE

CAS# 1330-20-7

% BY WT: 11.440

VAPOR PRESSURE:

8.00 MMHG @ 68F LEL: 1.0

EXPOSURE LIMIT:

ACGIH-TLV

100.0 PPM

OSHA-PEL

150.0 PPM

MAK/TRK (Germany)

100 PPM

BAT (Germany)

1.5 MG/L

OTHER LIMITS:

EXPERIMENTAL: TERATOGEN, REPRO EFFECT. MUTAGENIC DATA.  
-----

ETHYL BENZENE

07 PHENYLETHANE

CAS# 100-41-4

% BY WT: 2.684

VAPOR PRESSURE:

7.10 MMHG @ 68F LEL: 1.2

EXPOSURE LIMIT:

ACGIH-TLV

100.0 PPM

OSHA-PEL

100.0 PPM

OSHA STEL

125.0 PPM

MAK/TRK (Germany)

100 PPM

BAT (Germany)

NONE

OTHER LIMITS:

MUTAGEN DATA.  
-----

PHENOL

08 HYDROXYBENZENE

CAS# 108-95-2

% BY WT: 3.808

VAPOR PRESSURE:

.29 MMHG @ 68F LEL: 1.5

EXPOSURE LIMIT:

ACGIH-TLV

5.0 PPM (SKIN)

OSHA-PEL

10.0 PPM

OTHER

5.0 PPM (SKIN)

\*\*\*\*\*

20-136-CF WATSON-STANDARD COMPANY Page 3  
CLEAR COATING MATERIAL SAFETY DATA SHEET

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-----  
SECTION II HAZARDOUS INGREDIENTS  
-----

MAK/TRK (Germany) 10.0 PPM

OTHER LIMITS:

EXPERIMENTAL: CARCINOGEN. MUTAGEN DATA. POISON.

-----  
FORMALDEHYDE

09 FORMALIN CAS# 50-00-0  
% BY WT: .238 LEL: 7.0

EXPOSURE LIMIT:

ACGIH-TLV 1.0 PPM  
OSHA-PEL 0.75 PPM  
OSHA STEL 2.0 PPM  
MAK/TRK (Germany) 0.5 PPM  
BAT (Germany) NONE

OTHER LIMITS:

EXPERIMENTAL: REPRO EFFECTS. MUTAGEN DATA. CARCINOGEN

-----  
METHYL ISOBUTYL KETONE

10 HEXONE CAS# 108-10-1  
% BY WT: 20.232 VAPOR PRESSURE: 16.00 MMHG @ 68F LEL: 1.4

EXPOSURE LIMIT:

ACGIH-TLV 50.0 PPM  
OSHA-PEL 75.0 PPM  
MAK/TRK (Germany) 100 PPM  
BAT (Germany) 3.5 MG/L

OTHER LIMITS:

NARCOTIC.

\*\*\*\*\*

This product contains one or more reported carcinogens or suspected carcinogens which are noted NTP, IARC, or OSHA-Z in the other limits recommended column.

\*\*\*\*\*

This product contains pigments which may become a dust nuisance when removed by abrasive blasting, sanding, or grinding.

\*\*\*\*\*

-----  
SECTION III PHYSICAL DATA  
-----

Boiling Range: High- 359.4 F Low- 169.0 F  
Vapor Pressure: 16.00 MMHG 676.799  
Vapor Density: Heavier Than Air  
Evaporation Rate: Faster than Ether  
Wt per Gallon: 7.91  
Specific Gravity: .95

\*\*\*\*\*

20-136-CF  
CLEAR COATING

WATSON-STANDARD COMPANY  
MATERIAL SAFETY DATA SHEET

Page 4

\*\*\*\*\*

% volatile by Volume: 79.60  
% volatile by Weight: 71.39  
VOC: 5.648  
Physical State: N/A  
Appearance: N/A  
Odor: N/A  
Odor Threshold: N/A  
pH: N/A  
Freezing Point: N/A  
Water Solubility: N/A  
Coefficient of Water/Oil Distribution: N/A  
Mechanical Impact Explosion: N/A  
Static Electricity Explosion: N/A

-----  
SECTION IV FIRE AND EXPLOSION HAZARD DATA  
-----

Flammability Classification: Class 1C DOT: Flammable Liquid  
Actual Flashpoint TCC: 76.0 F  
Explosion Level: Lower- .9 Upper- 73.0  
Upper Flammability Limit: N/A  
Lower Flammability Limit: N/A  
Auto Ignition Temperature: N/A  
DOT #: N/A

-----  
SECTION II HAZARDOUS INGREDIENTS  
-----

EXTINGUISHING MEDIA

Based on the presence of components (03,10) the National Fire Protection Association Class B extinguisher is designed to extinguish NFPA Class 1B flammable liquid fires.

SPECIAL FIRE FIGHTING PROCEDURES

Clear fire area of unprotected personnel. Do not enter confined space without helmet, face shield, bunker coat, gloves, rubber boots, and a positive pressure NIOSH-approved self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Based on the presence of components (01,02,03,10) keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Closed container may explode when exposed to extreme heat. Do not apply to hot surfaces. Never use welding or cutting torch on or near container (even empty) because product (even residue) may ignite explosively.

Based on the presence of components (01,03,10) liquid and vapor states of this substance are dangerous fire hazards and moderate explosion hazards when exposed to heat or flame.

SPECIAL FIRE FIGHTING PROCEDURES

Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable.

\*\*\*\*\*

20-136-CF  
CLEAR COATING

WATSON-STANDARD COMPANY  
MATERIAL SAFETY DATA SHEET

Page 5

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-----  
SECTION V HEALTH HAZARD DATA  
-----

EFFECTS OF EXCESSIVE OVEREXPOSURE

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Do not breathe vapors or spray mist. Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during and after application unless air monitoring demonstrates vapor/mist levels are below applicable limits. Follow respirator manufacturer's directions for respirator use.

This mixture contains trace amounts of FREE FORMALDEHYDE which has been designated by ACGIH as an "Industrial substance suspected of carcinogenic potential for man."

Based on the presence of components (08,09) this product is presumed to be severely toxic.

Based on the presence of components (02,05,06,07, this product may cause skin irritation and drying/defatting or cracking, and dermatitis on repeated or prolonged exposure to the skin.

Based on the presence of components (07) may cause sensitization in susceptible individuals.

Based on the presence of components (07) this product has low toxicity but is readily absorbed and can carry other materials through intact skin.

Based on the presence of components (08) this product is corrosive.

Based on the presence of components (08) it is highly irritating to the skin and may cause chemical burns.

Based on the presence of components (03) contact with the eyes may cause transient corneal damage, conjunctival irritation, and burns if not promptly removed.

Based on the presence of components (03,08) this product is severely irritating to the eyes. Exposure may cause extensive corneal injury.

Based on the presence of components (01,03,07,10) this product is irritating to the upper respiratory tract.

Based on the presence of components (03,07) this product is irritating to the mucous membranes.

Based on the presence of components (02,09) this product causes severe respiratory irritation.

Based on the presence of components (01) may cause lung injury.

Based on the presence of components (07) pulmonary edema may develop with inhalation of high concentrations of this material.

Based on the presence of components (03,05,06,08) vapors of this product may cause irritation of the eyes, nose, throat, upper respiratory tract, mucous membranes, and skin.

Based on the presence of components (01,09) headaches, nausea, dizziness, and vomiting may occur from inhalation.

Based on the presence of components (07) high vapor concentrations may cause CNS depression.

Based on the presence of components (03,05,10) excessive inhalation of vapors can cause nasal and respiratory irritation, dizziness, weakness,

\*\*\*\*\*

\*\*\*\*\*

f    gue, nausea, headache, possible unconsciousness and even asphyxiation. Based on the presence of components (03,07) may affect the brain or nervous system, causing dizziness, headache or nausea.

Based on the presence of components (08) excessive exposure can cause drowsiness, nausea, headache, fatigue, dizziness, and even death.

Based on the presence of components (01,08) chronic overexposure to this product may cause kidney and liver injury.

Based on the presence of components (06,09) ingestion of this material may cause severe acidosis from metabolism, resulting in severe stomach pain, nausea, coma and even death.

Based on the presence of components (01,02) ingestion may cause possible kidney damage.

Based on the presence of components (01,02) ingestion may cause possible liver damage.

Based on the presence of components (07) aspiration can be a hazard if this material is swallowed.

Based on the presence of components (08) ingestion and excessive inhalation can be fatal.

#### FIRST AID

EYE CONTACT: Flush with luke warm water for 15 minutes. Seek physician immediately.

SKIN CONTACT: Flush wash with copious amounts of luke warm water. Remove contaminated clothing promptly. Contact a physician immediately.

INHALATION: Remove exposed individual to fresh air. Restore breathing if required. Contact a physician immediately.

INGESTION: Rinse mouth immediately. Give exposed individual 6 to 8 ounces of liquid. (Never give anything by mouth to an unconscious person.) Do NOT induce vomiting unless advised by a physician. Contact a physician immediately.

-----  
SECTION VI    REACTIVITY DATA  
-----

#### INCOMPATIBILITY (Materials to Avoid)

Based on the presence of components (05,06,07,10) this product is incompatible with strong oxidizing agents; contact with these materials may cause fire or explosion.

Based on the presence of components (01,09) this material can react violently with strong oxidizing agents such as chlorine, oxygen, or such strong oxidizing acids as nitric and sulfuric.

Based on the presence of components (02,03,08) this raw material is incompatible with strong oxidizing agents, strong mineral acids, alkali metals, and halogens.

#### HAZARDOUS PRODUCTS OF DECOMPOSITION

Produce hazardous fumes when heated to decomposition.  
-----

SECTION VII    SPILL OR LEAK PROCEDURES  
-----

#### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Stay upwind and away from spill or leak unless wearing appropriate protective equipment. Stop and/or contain discharge if it may be done safely. Keep all sources of ignition away. Ventilate area of spill. Use no sparking tools for cleanup. Cover with inert material to reduce fume. Keep out of drains, sewer, or waterways. If large spill call spill response



\*\*\*\*\*  
WATSON-STANDARD COMPANY  
MATERIAL SAFETY DATA SHEET

20-136-CF

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CLEAR COATING

\*\*\*\*\*  
t s. Contact fire authorities. Notify local health and pollution control agencies.

WASTE DISPOSAL METHOD

DO NOT FLUSH TO SEWER, WATERSHED, OR WATERWAY.

Dispose of product in accordance with applicable local, county, state, and federal regulations.

-----  
SECTION VIII SAFE HANDLING AND USE INFORMATION  
-----

EYE PRECAUTION

Based on the presence of components (01,06,07,09, this product is severely irritating to the eyes. Exposure may cause extensive corneal injury. Eyewash stations and safety showers should be readily available in use and handling area.

PROTECTIVE GLOVES

Required for prolonged or repeated contact. Wear resistant gloves such as natural rubber, neoprene, buna N or nitrile. An apron should be worn to avoid skin contact.

PROTECTIVE EYEWEAR

Avoid contact with eyes. Wear goggles if there is a likelihood of contact with eyes.

HYGIENIC PRACTICES

WASH HANDS THOROUGHLY BEFORE EATING AND USING WASHROOM.

Remove contaminated clothing immediately and do not wear it until it has been properly laundered.

RESPIRATORY PROTECTION

Use respirator in case of vapor, fumes, dust and mist.

VENTILATION

Use ventilation as required to control vapor, dust, and fumes. Avoid prolonged or repeated breathing of vapors. If exposure exceeds TLV, use a NIOSH-approved respirator to prevent overexposure.

-----  
SECTION IX SPECIAL PRECAUTIONS  
-----

Bond and ground metal containers when transferring liquid.

Personnel should avoid inhalation of vapors. Personal contact with the product should be avoided. Should contact be made, remove saturated clothing and flush affected skin areas with water. Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in this sheet must be observed. Do not take internally.

Sprinkler fire protection is desirable in areas of storage, handling, & use

HANDLING AND STORING PRECAUTIONS

Keep product containers cool, dry, and away from sources of ignition. Use and store this product with adequate ventilation. Do NOT smoke in storage areas.

-----  
SECTION XX SECTION 313 TOXIC CHEMICALS  
-----

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

Chemical

CAS Number

Weight %

\*\*\*\*\*

20-136-CF  
CLEAR COATING

WATSON-STANDARD COMPANY  
MATERIAL SAFETY DATA SHEET

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\*\*\*\*\*

2	TOXYETHANOL	111-76-2	11.501
	N-BUTYL ALCOHOL	71-36-3	12.011
	PSEUDOCUMENE	95-63-6	1.350
	XYLENE	1330-20-7	11.440
	ETHYL BENZENE	100-41-4	2.684
	PHENOL	108-95-2	3.808
	FORMALDEHYDE	50-00-0	.238
	METHYL ISOBUTYL KETONE	108-10-1	20.232

-----

THE INFORMATION CONTAINED HEREIN IS INFORMATION RECEIVED  
FROM OUR RAW MATERIAL SUPPLIERS AND OTHER SOURCES AND  
IS BELIEVED TO BE RELIABLE. THIS DATA IS NOT TO BE TAKEN  
AS A WARRANTY OR REPRESENTATION FOR WHICH WATSON-STANDARD  
COMPANY ASSUMES LEGAL RESPONSIBILITY.

-----

DECORATING & SOLVENTS  
09/02/97

MANUFACTURER	DATE	DESCRIPTION
ACME/INX, INT'L		T.P. INKS
AKZO	09/22/93	866-C27-0003 DUO CLEAR
AKZO	04/25/97	220-W27-1024 WHITE
AKZO	01/21/93	375-W27-5017 WHITE
AKZO	02/04/93	867-W27-7009 DUO WHITE
AKZO	09/01/92	374-C27-4033 CLEAR
AKZO	01/14/97	374-C27-5020 H-23
AKZO	07/29/88	XR-1215 WHITE ENAMEL
AKZO	06/21/94	375-Z27-5048 ALUMINUM
AKZO	11/14/94	375-E27-0006 AL. ADD.
AKZO	01/04/97	222-R27-2012 JLC ROSE
AKZO	01/03/95	222-Y27-2008 LF BRITE
AKZO	01/04/97	375-W27-5026 WHITE
AKZO	03/22/97	JLC2841-H COPPER ENAMEL
AKZO	11/26/96	222-Y27-0008 PMS 474C
ASHLAND CHEMICAL	03/13/86	BASF INK REDUCER
DYALL PRODUCTS	10/23/85	BASF NON-SCRATCH
EIANN LAKKE		IT-404-077 INTERNAL
W.R. GRACE	08/04/92	DAREX 313 COLD SEAL
W.R. GRACE	01/26/89	DAREX B-31F COLD SEAL
W.R. GRACE	07/31/91	AMR-12 WAX
INMONT	06/01/79	PURE COLOR INKS
INMONT	06/01/79	INK OIL
INMONT	06/01/79	ANTI-OXIDANT
INX	09/24/96	M83721 POLY NOVAR BLACK
INX	03/27/96	C71378 TP HARD DRY BLACK
MORTON	04/29/94	PE-1090-21
PETRO PRODUCTS	11/15/85	METHYL ETHYL KETONE
PETRO PRODUCTS	04/08/87	GLYCOL ETHER EB
PETRO PRODUCTS	07/01/86	2300 VINYL REDUCER
PETRO PRODUCTS	02/11/93	660 SOLVENT
PETRO PRODUCTS	02/18/86	PHOSPHORIC ACID
PETRO PRODUCTS	03/09/87	GLYCOL ETHER DB
PETRO PRODUCTS	04/08/86	MINERAL SPIRITS
PETRO PRODUCTS	04/10/86	150 SOLVENT
PETRO PRODUCTS	06/10/92	ISOPHORONE
SAFETY KLEEN	02/11/93	6605 SOLVENT
SPRAY-ON	02/01/92	MARKING PAINTS
STRAHL & PITSCHE	05/01/72	SP-1103 WAX
SUN CHEMICAL	01/07/91	SOLVENT
SUN CHEMICAL	01/24/91	METAL DECO INKS
VALSPAR	10/23/96	5061-041 LINING
VALSPAR	04/30/92	3846-044 LINING
VALSPAR		189005 LINING
WATSON STANDARD	03/14/96	10-084CF LINING
WATSON STANDARD	01/22/96	10-084D LINING

# ACME PRINTING INK CO.

LITHOGRAPHIC • LETTERPRESS • FLEXOGRAPHIC • GRAVURE

1419 W. CARROLL AVENUE • CHICAGO, ILL. 60607

(312) 421-0675

November 27, 1978

RECEIVED

NOV 28 1978

J. L. Clark Mfg. Company  
Atlas Tube Division  
2300 Wisconsin Avenue  
Downers Grove, Illinois 60515

J. L. CLARK, ATLAS TUBE DIV  
DOWNERS GROVE, ILL.

Attention: Mr. Stanley Bambas

Dear Mr. Bambas:

In response to our telephone conversation, this is to confirm that unless requested in writing by you, we will manufacture all your inks as non-toxic otherwise known as low lead inks. As you well know, within the last year we have instituted this program on all new matches and will continue to do so.

If you have any inks in stock which may date back 4 or 5 years prior to the introduction of this non-toxicity program by you, please advise us at the time of reordering to enable us to convert these inks to a non-toxic type.

If I can be of any further service to you in this matter please do not hesitate to contact me.

Yours truly,

*Fred Wiencek*

Fred Wiencek

FW:ct

cc: R. Allara

H. G. Schmidtke

*sent form  
12-6-78*

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

Form Approved  
OMB No. 44-11387

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME

ACME PRINTING INK CO.

EMERGENCY TELEPHONE NO.

(312) 421-0675

ADDRESS (Number, Street, City, State, and ZIP Code)

1419 W. Carroll Ave., Chicago, Il. 60607

CHEMICAL NAME AND SYNONYMS

T.P. 3/Pc. Colors

TRADE NAME AND SYNONYMS

BASE COLOR SYSTEM

CHEMICAL FAMILY

FORMULA

## SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS Organic			BASE METAL		N/A
CATALYST Cerium & Mang. Octoate			ALLOYS		"
VEHICLE Alkyd Resin			METALLIC COATINGS		"
SOLVENTS Aliphatic			FILLER METAL PLUS COATING OR CORE FLUX		"
ADDITIVES			OTHERS		"
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)

## SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	460-580	SPECIFIC GRAVITY (H <sub>2</sub> O=1)	
VAPOR PRESSURE (mm Hg.) <0.1 mm at	150°F.	PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)	No Data	EVAPORATION RATE (butyl acetate = 1)	<0.1
SOLUBILITY IN WATER	Insoluble		
APPEARANCE AND ODOR	Colored Paste, Aliphatic		

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	> 220°F ASTM D-93	FLAMMABLE LIMITS	Lel N/A	Uel N/A
EXTINGUISHING MEDIA	Carbon Dioxide, Chemical or Foam			
SPECIAL FIRE FIGHTING PROCEDURES	None			
USUAL FIRE AND EXPLOSION HAZARDS	None			

## SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

Breathing of high vapor concentration may cause drowsiness.  
Ink may cause minor skin irritation and severe eye irritation.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation: Remove to ventilated area. Apply artificial respiration if necessary. Wash skin with soap and water. Flush eyes with water. Contact a physician.

## SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATIBILITY (Materials to avoid)

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide from incomplete combustion.

HAZARDOUS  
POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

X

## SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Add absorbent and scoop into disposal container. Wash or steam clean area.

WASTE DISPOSAL METHOD

Dispose of by method allowed in your locality.

## SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) None needed.

VENTILATION

LOCAL EXHAUST

SPECIAL

MECHANICAL (General) X

OTHER

PROTECTIVE GLOVES

Rubber gloves if contact is prolonged

EYE PROTECTION

Safety glasses.

OTHER PROTECTIVE EQUIPMENT

Safety shower and eye bath.

## SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep inks away from excessive

heat and open flames. Shelf life varies, but is usually at least 6 months.

OTHER PRECAUTIONS

DECC

# MATERIAL SAFETY DATA SHEET

HMIS H2 F2 R0 WHMIS: B3:D2B

Date Prepared: 09/22/93

Date Revised: 09/22/93

PREPARED FOR:

PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO COATINGS INC. - ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000

DOWNERS GROVE IL 60515

ZION IL 60099

Emergency Phone Number:

(708) 872-1000

Information Number:

(708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:  
NA

Product No.  
866- 027-0003

Customer Part No.

Product - Class: DUO-CLEAR INTERIOR SPRAY

DOT Code: NA

## SECTION II - HAZARDOUS INGREDIENTS

### Hazardous Ingredients

### Ingredient Data

2-HEPTANONE  
(MAK)

% by Weight	24.0 %
Cas No.	000110-43-0
Vapor Pres.	2.1@ 68F mm/Hg
TLV-TWA	50.0 ppm
PEL-TWA	100.0 ppm
ORAL-LD50	1600 mg/Kg RAT
DERM-LD50	10000 mg/Kg RABBIT
Inhalation	2000 ppm RAT-4 HOU

1-METHOXY-2-ACETOXYPROPANE

% by Weight	23.7 %
Cas No.	000108-65-6
Vapor Pres.	3.7@ 68F mm/Hg
TLV-TWA	NA
PEL-TWA	NA
ORAL-LD50	2532 mg/Kg RAT-FEMAL
DERM-LD50	5000 mg/Kg RABBIT

#2-BUTOXYETHANOL  
(ETHYLENE GLYCOL BUTYL ETHER)

% by Weight	23.7 %
Cas No.	000111-76-2
Vapor Pres.	1.6@ 68F mm/Hg
TLV-TWA	25.0 ppm*
PEL-TWA	25.0 ppm*
ORAL-LD50	1480 mg/Kg RAT
DERM-LD50	490 mg/Kg RABBIT
Inhalation	700 ppm MOUSE-7

PHENOL-FORMALDEHYDE RESIN

% by Weight	4.7 %
Cas No.	-

Vapor Pres.	NA
TLV-TWA	NA
PEL-TWA	NA

#This material is subject to reporting under SARA TITLE III, SECTION 313  
All components in this coating have been verified as being on the TSCA Inventory

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

### SECTION III - PHYSICAL DATA

Physical state: LIQUID  
Odor and appearance: NA  
Odor threshold (ppm): 1000  
pH: NA

Boiling Range: 295 - 330 F ( 146 - 165 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (Vol) 75.14      Lb/gal(U.S.) 8.15      SpGr:

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	5.76	Total Organic Solvents	5.75
Less Water & Exempt (EPA)	5.76	Total Non-Exempt Solvents	5.75

Solvent Density 7.6620

### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

FP: (CLOSED) 102 F ( 38 C) LEL 1.10%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.



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SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

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EFFECTS OF OVEREXPOSURE: CAUSES EYE IRRITATION. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. CAN BE ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY CAUSE LUNG IRRITATION. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: narcosis, vomiting, weakness, drowsiness, inflammation of the mucous membranes of the nose and throat, dermatitis, diarrhea, dehydration to skin, loss of coordination, necrosis of the skin, lacrimation, conjunctivitis, hemolysis.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: skin disorders.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, blood effects, eye damage.

Caution: Contains formaldehyde which caused cancer in laboratory animals by inhalation and is listed as a suspect carcinogen by NTP and IARC (Group-2B). Contains a phenol-formaldehyde resin which, under certain conditions, could release formaldehyde in sufficient quantities to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

---

**SECTION VI - REACTIVITY DATA**

---

material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen,  
various hydrocarbons, phenol, formaldehyde.

CONDITIONS TO AVOID: temperatures above 100 degrees, open flame, sparks,  
light.

MATERIALS TO AVOID: alkali, acids, oxidizers.

---

**SECTION VII - SPILL AND LEAK PROCEDURES**

---

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources  
of ignition. Wear appropriate safety equipment as listed in Section  
VIII. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and  
local regulations. Incineration is the preferred method of disposal.

---

**SECTION VIII - SAFE HANDLING AND USE INFORMATION**

---

RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator  
(NIOSH/MSHA approved) during application and handling unless air  
monitoring demonstrates vapor/mist levels below applicable limits.  
Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne  
concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when  
handling this product. Check with glove manufacturer to determine  
proper glove type.

EYE PROTECTION: Splash-proof chemical goggles should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided.  
Rubber apron should be worn.

HYGENIC PRACTICES: Good personal hygiene practices are required at all times  
when handling chemicals. These practices include, but are not limited  
to, washing when safety equipment is removed, at the end of each shift  
or when going on breaks and especially if contamination occurs.

---

SECTION IX - SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area. Store away from open flame

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: formaldehyde, glycol ether.

This product contains the following California proposition 65 suspect carcinogens: formaldehyde.

---

SECTION X - OTHER INFORMATION

---

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

---

ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than                      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEIL - Ceiling Limit

• @ - At

• OSHA - Occupational Safety and Health Administration

• IARC - International Agency for Research on Cancer

• TP - National Toxicology Program

• SARA - Superfund Amendments & Reauthorization Act (1986)

• DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HNIS: H2 F2 R0 HNHS: R2:D2B

Date Prepared: 04/05/97

Date Revised: 10/24/97

PREPARED FOR:

PREPARED BY:

365000 F. L. CLARK MFG.  
2300 WISCONSIN AVE.

AMCO MODEL COATINGS INC.-IL  
1915 INDUSTRIAL AVENUE  
1947-1972-1999 1947-1972-1999  
ZION IL 60099-1499

DUNHEIM GROVE IL 60515

Emergency Phone Number:  
Information Number:

(847) 872-1000  
(847) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:

Product No.  
226- H27-1024

Customer Part No.  
4122027

Product - Class: WHITE POLYESTER THIN

## SECTION II - HAZARDOUS INGREDIENTS

### Hazardous Ingredients

### Ingredient Data

#### TITANIUM DIOXIDE

% by Weight  
Cas No. 013463-67-7  
Vapor Pres.  
TLV-TWA 10.0 mg/m<sup>3</sup>  
PEL-TWA 15.0 mg/m<sup>3</sup>

#### ORGANIC SOLVENT

% by Weight  
Cas No.  
Vapor Pres.  
TLV-TWA 100.0 ppm  
PEL-TWA

#### METHYLATED NAT. RESIN

% by Weight  
Cas No. 000000-12-1  
Vapor Pres.  
TLV-TWA  
PEL-TWA  
IDLH-LD50 12000 mg/kg ORL  
IDLH-LD50 110000 mg/kg RABBIT

#### STYRENE/ALYL. ALCOHOL RESIN

% by Weight  
Cas No. 005110-62-4  
Vapor Pres.  
TLV-TWA 10.0 mg/m<sup>3</sup>  
PEL-TWA 15.0 mg/m<sup>3</sup>  
IDLH-LD50 25000 mg/kg ORL  
IDLH-LD50 10000 mg/kg RABBIT

#### ANAPHTHOLINE

% by Weight 2.0 %  
Cas No. 000001-10-7

BY/LENE, NISCH ISOMERS

WAPOR PRESS	< 1	mg/kg 3 sec
TEL-TM	10.0	ppm
TEL-TM	10.0	ppm
TEL-TM	15.0	ppm
TEL-TM	420.	mg/kg 3 sec
TEL-TM	25000.	mg/kg 3 sec
TEL-TM	> 340.	mg/kg 3 sec
TEL-TM	1.9 %	
TEL-TM	091330-20-7	
WAPOR PRESS.	5.1	mg/kg 3 sec
TEL-TM	100.0	ppm
TEL-TM	100.0	ppm
TEL-TM	150.0	ppm
TEL-TM	4300.	mg/kg 3 sec
TEL-TM	> 1700.	mg/kg 3 sec
TEL-TM	5000.	mg/kg 3 sec

11, 2, 4-TRINITROBENZENE

% by Weight	1.9 %
Case No.	090095-53-6
WAPOR Press.	
TEL-TM	25.0 ppm
TEL-TM	25.0 ppm
TEL-TM	5000. mg/Kg FAT
TEL-TM	18000. mg/Kg FAT
% by Weight	
Case No.	921505-51-2
WAPOR Press.	
TEL-TM	10.0 mg/Kg
TEL-TM	15.0 mg/Kg

ALUMINA IMPROVED

Alumina material is subject to reporting under CERCLA TITLE III, SECTION 311.

All components in this product have been verified as being on the CERCLA Inventory.

SECTION III - PHYSICAL DATA

Physical State: Solid  
 Odor and Appearance: Odorless  
 Odor Threshold (ppm): 0.260  
 pH: 7.0

Boiling Range: 227 - 429 F (115 - 217 C)

Vapor is heavier than air.

Evaporation rate is slower than water.

Relative Volatility: 29.54

Boiling Point: 227 F

Water Solubility (mg/L): 100

Water Solubility (ppm): 100

Water Solubility (mg/L): 100

Water Solubility (ppm): 100

Water Solubility (mg/L): 100

Solvent Density

7.44

---

SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED) 118 F ( 47 C) LEL 1.05%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

This is the OSHA classification, GSI may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to cooling's hazardous ingredients and hazardous decomposition products.

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SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE:

SKIN: CAUSES SKIN IRRITATION. Other effects of skin contact may include dermatitis.

Eye: CAUSES EYE IRRITATION.

Inhalation: MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE LUNG IRRITATION. Other effects of inhalation may include nausea, shortness of breath, dehydration, dizziness, weakness, headache, fatigue, depression.

Skin absorption: NO

Ingestion: HARMFUL IF SWALLOWED. Other effects of ingestion may include gastric disturbances, nausea, vomiting, diarrhea, weakness, headache, dizziness, fatigue, depression.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, respiratory conditions

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause central nervous system damage, vision, hearing, liver abnormalities, kidney abnormalities, blood effects.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspected carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

**EMERGENCY AND FIRST AID PROCEDURES**

**SKIN CONTACT:** Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

**EYE CONTACT:** Flush with water for at least 15 minutes and get medical attention.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

**INGESTION:** Get medical attention IMMEDIATELY.

**SECTION VI - REACTIVITY DATA**

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

**HAZARDOUS DECOMPOSITION PRODUCTS:** oxides of carbon, oxides of nitrogen, fluorine, various hydrocarbons, ammonia, formaldehyde, aldehydes, acids, methanol, aluminum oxide, styrene, allyl alcohol, nitrogen compounds, ethanol.

**CONDITIONS TO AVOID:** temperatures above 120 degrees, open flame, sparks, dusty conditions.

**HAZARDOUS TO AVOID:** oxidizers, water, strong acids, strong bases, strong halides.

**SECTION VII - SPILL AND LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII. Assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb or lower material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.



## SECTION 11 - USE, HANDLING AND USE INFORMATION

**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator

(NIOSH/MSHA approved) during application and handling unless the  
handling demonstrates acceptable levels below applicable limits.  
Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne  
concentrations below PEL, PEL and TLL limits as listed in Section II.

**PROTECTIVE CLOTHES:** Chemical resistant protective gloves should be worn when  
handling this product. Check with glove manufacturer to determine  
proper glove type.

**Eye Protection:** Safety glass chemical goggles should be worn.

**OTHER PROTECTIVE EQUIPMENT:** Eye wash and safety shower should be provided.  
Neither shower should be worn.

**HYGIENE AND FIRST AID:** Good personal hygiene practices are required in all cases  
when handling chemicals. These practices include, but are not limited  
to, washing when safety equipment is removed, at the end of each shift  
and when getting breaks and especially if contamination occurs.

## SECTION 12 - SPECIAL PRECAUTIONS

**PRECAUTIONS TO BE TAKEN IN ROOMS AND STORAGE:** This material should be  
stored in a cool, dry area. Store below 120 degrees  
Fahrenheit. Store away from ignition sources. Avoid wet conditions.  
Avoid precipitation. All precautions must be observed. Pesticide containers  
are in product pesticides.

## SECTION 13 - OTHER INFORMATION

The absence of a positive finding indicates that we believe, to the best of  
our knowledge, that the mixture is safe.

Disclaimer: This MSDS contains the information that we are currently  
aware of and does not constitute a warranty or representation for which we are  
liable. We assume no liability for any injury or damage resulting from the use of  
this product. The user should read the label and follow the instructions and  
precautions. These data and information must be interpreted by the user to be in  
accordance with applicable Federal, State and local laws and  
regulations.

Not Properly Labeled: This product is not properly labeled.

ABBREVIATIONS USED IN PREPARING THIS NOTE

MSDS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/L - Milligrams per Liter

LEL - Lower Explosion Limit

PP - Flash Point

LB/GAL - Pounds Per Gallon

NA - Not Available or Not Applicable

mg/L - Milligrams Per Liter

PPM - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than

% - Percent

# - Pounds

UN No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-1050 - Oral Lethal Dose (50% Death)

INHAL-1050 - Inhalation Lethal Concentration (50% Death)

DERM-1050 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

SEL - Short Term Exposure Limit

PEL - Ceiling Limit

OSHA - Occupational Safety and Health Administration

NIH - National Institute of Health

NIH - National Institute of Health

NIH - National Institute of Health

NIH - National Institute of Health

NIH - National Institute of Health

NIH - National Institute of Health

# MATERIAL SAFETY DATA SHEET

HMIS H2\* F2 R0

Date Prepared: 01/21/93

PREPARED FOR:

PREPARED BY:

00365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO COATINGS INC. - ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000

DOWNERS GROVE IL 60515 ZION IL 60099

Emergency Phone Number: (708) 872-1000

Information Number: (708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:  
MA

Product No.  
375- W27-5017

Customer Part No.

Product - Class: WHITE TUBE ENAMEL

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
#XYLENE, MIXED ISOMERS	<p>% by Weight 42.8 %</p> <p>Cas No. 001330-20-7</p> <p>Vapor Pres. 5.1@ 68F mm/Hg</p> <p>TLU-TWA MA</p> <p>PEL-TWA 100.0</p> <p>TLU-STEL 150.0 ppm 15 MINUTES</p> <p>PEL-STEL 150.0 ppm 15 MINUTES</p> <p>ORAL-LD50 4300. ng/Kg RAT</p> <p>INHAL-LC50 5000. ppm RAT-4 HOUR</p>
ISOPHORONE	<p>% by Weight 24.0 %</p> <p>Cas No. 000078-59-1</p> <p>Vapor Pres. 1.0@ 68F mm/Hg</p> <p>TLU-TWA 5.0 ppm</p> <p>PEL-TWA 4.0 ppm</p> <p>ORAL-LD50 2330. ng/Kg RAT</p> <p>DERM-LC50 1500. ng/Kg RABBIT</p>
POLY VC/VA COPOLYMER	<p>% by Weight 14.9 %</p> <p>Cas No. 009003-22-9</p> <p>Vapor Pres. MA</p> <p>TLU-TWA 10.0 ng/m3</p> <p>PEL-TWA 10.0 ng/m3</p>
#ETHYL BENZENE	<p>% by Weight 10.0 %</p> <p>Cas No. 000100-41-4</p> <p>Vapor Pres. 7.1@ 68F mm/Hg</p> <p>TLU-TWA 100.0 ppm</p> <p>PEL-TWA 100.0 ppm</p> <p>TLU-STEL 125.0 ppm 15 MINUTES</p> <p>PEL-STEL 125.0 ppm 15 MINUTES</p>

	ORAL-LD50	3500.	ng/Kg RAT
	DERM-LC50	5000.	ng/Kg RABBIT
TITANIUM DIOXIDE	% by Weight	2.5 %	
	Cas No.	013463-67-7	
	Vapor Pres.	NA	
	TLV-TWA	10.0	ng/n3
	PEL-TWA	10.0	ng/n3
#METHYL ISOBUTYL KETONE	% by Weight	1.0 %	
(MIBK)	Cas No.	000108-10-1	
(4-METHYL-2-PENTANONE)	Vapor Pres.	15.0@ 68F	mm/Hg
	TLV-TWA	50.0	ppm
	PEL-TWA	50.0	ppm
	TLV-STEL	75.0	ppm 15 MINUTES
	PEL-STEL	75.0	ppm 15 MINUTES
	ORAL-LD50	1600.	ng/Kg RAT
	INHAL-LC50	2000.	ng/n3 RAT-4 HOUR
#VINYL ACETATE	% by Weight	.2 %	
	Cas No.	000108-05-4	
	Vapor Pres.	88.0@ 68F	mm/Hg
	TLV-TWA	10.0	ppm
	PEL-TWA	10.0	ppm
	TLV-STEL	20.0	ppm 15 MINUTES
	PEL-STEL	20.0	ppm 15 MINUTES
	ORAL-LD50	2920.	ng/Kg RAT
	DERM-LC50	2335.	ng/Kg RABBIT
	INHAL-LC50	1550.	ppm MOUSE

#This material is subject to reporting under SARA TITLE III, SECTION 313  
 All components in this coating have been verified as being on the TSCA Inventory

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### SECTION III - PHYSICAL DATA

---

Physical state: LIQUID  
 Odor and appearance: NA  
 Odor threshold (ppm): .0920  
 pH: NA

Boiling Range: 246 - 424 F ( 118 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 85.75      Lb/gal(U.S.) 8.08      SpGr: .97

UOC Data Lb/Gal(U.S.):

Less Water (EPA)	6.33	Total Organic Solvents	6.32
Less Water & Exempt (EPA)	6.33	Total Non-Exempt Solvents	6.32

---

SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED) 110 F ( 43 C) LEL .80%  
Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE: HARMFUL IF SWALLOWED. CAUSES EYE IRRITATION. MAY CAUSE NOSE AND THROAT IRRITATION. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: pneumoconiosis, fatigue, nausea, reduced visibility, diarrhea, narcosis, vomiting, weakness, asphyxia, gastritis, drowsiness, inflammation of the mucous membranes of the nose and throat, deposits in eyes, dermatitis, unconsciousness, drying of nasal mucosa, shortness of breath, dehydration to skin.

PRIMARY ROUTE(S) OF ENTRY: ingestion, skin contact, inhalation.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, blood effects, eye damage, cardiac abnormalities, lung damage, liver abnormalities.

In accordance with 29CFR1910.1200, this product contains no ingredients listed by NTP, IARC or OSHA as carcinogenic. Contains isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*.

**SKIN CONTACT:** Flush with water for at least 15 minutes and get medical attention. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

**EYE CONTACT:** Flush with water for at least 15 minutes and get medical attention.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

**INGESTION:** Get medical attention IMMEDIATELY.

---

#### SECTION VI - REACTIVITY DATA

---

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

**HAZARDOUS DECOMPOSITION PRODUCTS:** hydrogen chloride, various hydrocarbons, oxides of carbon.

**CONDITIONS TO AVOID:** heat, sparks, open flame.

**MATERIALS TO AVOID:** amines, alkali, acids, halogenated solvents, oxidizers.

---

#### SECTION VII - SPILL AND LEAK PROCEDURES

---

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII. Absorb on inert material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

#### SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

**EYE PROTECTION:** Splash-proof chemical goggles should be worn.

**OTHER PROTECTIVE EQUIPMENT:** Eye bath and safety shower should be provided.

Rubber apron should be worn.

**HYGENIC PRACTICES:** Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

#### SECTION IX - SPECIAL PRECAUTIONS

---

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Store in a clean, dry area. Keep containers closed when not in use. Store in well-ventilated area. All equipment should be grounded. Store away from ignition sources.

**OTHER PRECAUTIONS:** All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: methyl isobutyl ketone, xylene (mixed isomers), ethylbenzene.

---

#### SECTION X - OTHER INFORMATION

---

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

**Disclaimer:** While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

#### ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEIL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SARA - Superfund Amendments & Reauthorization Act (1986)



# MATERIAL SAFETY DATA SHEET

HMIS H3\* F3 R0

Date Prepared: 02/04/93

PREPARED FOR:

PREPARED BY:

00365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.  
DOWNERS GROVE IL 60515

AKZO COATINGS INC. - ZION  
1915 INDUSTRIAL AVENUE  
(708) 872-1000 (708) 872-1000  
ZION IL 60099

Emergency Phone Number: (708) 872-1000  
Information Number: (708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename: NA Product No. 867- W27-7009 Customer Part No.

Product - Class: DUO-WHITE

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
TITANIUM DIOXIDE	% by Weight  Cas No. 013463-67-7  Vapor Pres. NA  TLV-TWA 10.0 ng/m3  PEL-TWA 10.0 ng/m3 
XYLENE, MIXED ISOMERS	% by Weight 20.9 %  Cas No. 001330-20-7  Vapor Pres. 5.1@ 68F mm/Hg  TLV-TWA NA  PEL-TWA 100.0  TLV-STEL 150.0 ppm 15 MINUTES  PEL-STEL 150.0 ppm 15 MINUTES  ORAL-LD50 4300. ng/Kg RAT  INHAL-LC50 5000. ppm RAT-4 HOUR 
ALPHA-HYDROXY TOLUENE	% by Weight  Cas No. 000100-51-6  Vapor Pres. .1@ 86F mm/Hg  TLV-TWA NA  PEL-TWA NA  ORAL-LD50 1230. ng/Kg RAT  DERM-LC50 2000. ng/Kg RABBIT  INHAL-LC50 1000. ppm RAT-8 HOUR 
#2-BUTOXYETHANOL (ETHYLENE GLYCOL BUTYL ETHER)	% by Weight 8.5 %  Cas No. 000111-76-2  Vapor Pres. .6@ 68F mm/Hg  TLV-TWA 25.0 ppm*  PEL-TWA 25.0 ppm*  ORAL-LD50 1480. ng/Kg RAT

	DERM-LC50	490.	ng/Kg	RABBIT
	IMHAL-LC50	700.	ppm	MOUSE-7 HOUR
#ETHYL BENZENE	% by Weight	4.9 %		
	Cas No.	000100-41-4		
	Vapor Pres.	7.1@ 68F	mm/Hg	
	TLU-TWA	100.0	ppm	
	PEL-TWA	100.0	ppm	
	TLU-STEL	125.0	ppm	15 MINUTES
	PEL-STEL	125.0	ppm	15 MINUTES
	ORAL-LD50	3500.	ng/Kg	RAT
	DERM-LC50	5000.	ng/Kg	RABBIT
BUTYLATED U/F RESIN	% by Weight			
	Cas No.	068002-19-7		
	Vapor Pres.	NA		
	TLU-TWA	NA		
	PEL-TWA	NA		
AROMATIC SOLVENT	% by Weight			
	Cas No.	- -		
	Vapor Pres.	NA		
	TLU-TWA	100.0	ppm	
	PEL-TWA	NA		
ALUMINUM OXIDE	% by Weight			
	Cas No.	001344-28-1		
	Vapor Pres.	NA		
	TLU-TWA	10.0	ng/m3	
	PEL-TWA	10.0	ng/m3	

#This material is subject to reporting under SARA TITLE III, SECTION 313  
All components in this coating have been verified as being on the TSCA Inventory

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

---

### SECTION III - PHYSICAL DATA

---

Physical state: LIQUID  
Odor and appearance: NA  
Odor threshold (ppm): .0920  
pH: NA

Boiling Range: 243 - 401 F ( 117 - 205 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 61.41      Lb/gal(U.S.) 9.96      SpGr: 1.19

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	4.63	Total Organic Solvents	4.63
Less Water & Exempt (EPA)	4.63	Total Non-Exempt Solvents	4.63

---

SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED) 81 F ( 27 C) LEL .90%  
Flammability Class (OSHA): FLAMMABLE LIQUID - 1C

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE: MAY CAUSE EYE BURNS. HARMFUL IF SWALLOWED. CAN BE ABSORBED THROUGH SKIN. MAY CAUSE NOSE AND THROAT IRRITATION. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: cough, necrosis of the skin, pneumoconiosis, diarrhea, inflammation of the mucous membranes of the nose and throat, asphyxia, abdominal pain, shortness of breath, loss of coordination, reduced visibility, lacrimation, conjunctivitis, hemolysis, weakness, gastritis, drying of nasal mucosa, unconsciousness, dehydration to skin, fatigue, dermatitis, vomiting, deposits in eyes.

PRIMARY ROUTE(S) OF ENTRY: skin contact, eyes, ingestion, inhalation.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, eye disorders, respiratory allergies.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: lung damage, blood effects, cardiac abnormalities, kidney damage, central nervous system damage, eye damage, liver abnormalities.

Caution: Contains a urea-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this

package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*.

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

---

SECTION VI - REACTIVITY DATA

---

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: fumes, formaldehyde, oxides of nitrogen, aldehydes, oxides of carbon, ammonia, toxic fumes, various hydrocarbons.

CONDITIONS TO AVOID: sparks, open flame, temperatures above 100 degrees, dusty conditions.

MATERIALS TO AVOID: oxidizers, acids, alkali, chlorine trifluoride.

---

SECTION VII - SPILL AND LEAK PROCEDURES

---

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Face-shield should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided.  
Rubber apron should be worn.

HYGENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

#### SECTION IX - SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in well-ventilated area. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. store away from open flame.

OTHER PRECAUTIONS: Empty container may retain product residues (vapor or liquid) All precautions must be observed.

This product contains the following SARA Title III, Section 313, reportable materials: ethylbenzene, xylene (mixed isomers), glycol ether.

---

#### SECTION X - OTHER INFORMATION

---

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

#### ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)  
INHAL-LC50 - Inhalation Lethal Concentration (50% Death)  
DERM-LD50 - Dermal Lethal Dose (50% Death)  
PEL - Permissible Exposure Limit  
TLV - Threshold Limit Value  
STEL - Short Term Exposure Limit  
CEIL - Ceiling Limit  
@ - At  
OSHA - Occupational Safety and Health Administration  
IARC - International Agency for Research on Cancer  
NTP - National Toxicology Program  
SARA - Superfund Amendments & Reauthorization Act (1986)

# MATERIAL SAFETY DATA SHEET

HMIS H2\* F2 R1

Date Prepared: 09/01/92

PREPARED FOR:

PREPARED BY:

00365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO COATINGS INC. - ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000

DOWNERS GROVE IL 60515 ZION IL 60099

Emergency Phone Number: (708) 872-1000

Information Number: (708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:  
NA

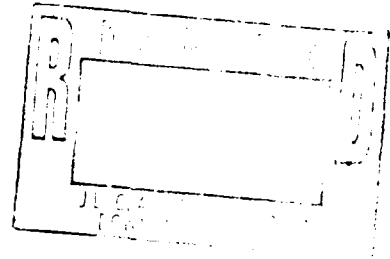
Product No.  
374- C27-4033

Customer Part No.

Product - Class: CLEAR VINYL XR3164

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
ISOPHORONE	% by Weight Cas No. 000078-59-1 Vapor Pres. 1.0@ 68F mm/Hg TLV-TWA 5.0 ppm PEL-TWA 4.0 ppm ORAL-LD50 2330. ng/Kg RAT DERM-LC50 1500. ng/Kg RABBIT
AROMATIC SOLVENT	% by Weight Cas No. - - Vapor Pres. NA TLV-TWA 100.0 ppm PEL-TWA NA
M1,2,4-TRIMETHYLBENZENE	% by Weight 9.1 % Cas No. 000095-63-6 Vapor Pres. NA TLV-TWA 25.0 ppm PEL-TWA 25.0 ppm
MXYLENE, MIXED ISOMERS	% by Weight 2.2 % Cas No. 001330-20-7 Vapor Pres. 5.1@ 68F mm/Hg TLV-TWA NA PEL-TWA 100.0 TLV-STEL 150.0 ppm 15 MINUTES PEL-STEL 150.0 ppm 15 MINUTES ORAL-LD50 4300. ng/Kg RAT INHAL-LC50 5000. ppm RAT-4 HOUR
MUMENE	% by Weight 2.2 %



BUVINYL ACETATE

Cas No.	000098-82-8	
Vapor Pres.	NA	
TLU-TWA	50.0	ppm
PEL-TWA	50.0	ppm
ORAL-LD50	1400.	mg/Kg RAT
INHAL-LC50	8000.	ppm RAT-4 HOURS
% by Weight	.1 %	
Cas No.	000108-05-4	
Vapor Pres.	88.0@ 68F	mm/Hg
TLU-TWA	10.0	ppm
PEL-TWA	10.0	ppm
TLU-STEL	20.0	ppm 15 MINUTES
PEL-STEL	20.0	ppm 15 MINUTES
ORAL-LD50	2920.	mg/Kg RAT
DERM-LC50	2335.	mg/Kg RABBIT
INHAL-LC50	1550.	ppm MOUSE

#This material is subject to reporting under SARA TITLE III, SECTION 313  
All components in this coating have been verified as being on the TSCA Inventory

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

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#### SECTION III - PHYSICAL DATA

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Physical state: LIQUID  
Odor and appearance: NA  
Odor threshold (ppm): NA  
pH: NA

Boiling Range: 305 - 424 F ( 131 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 84.32      Lb/gal(U.S.) 8.05      SpGr: .96

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	6.29	Total Organic Solvents	6.29
Less Water & Exempt (EPA)	6.29	Total Non-Exempt Solvents	6.29

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#### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

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FP: (CLOSED) 106 F ( 41 C)      LEL .80%  
Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.



SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

#### SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE: HARMFUL IF SWALLOWED. CAUSES EYE IRRITATION. MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

OTHER EFFECTS OF OVEREXPOSURE MAY INCLUDE: nausea, gastritis, pneumoconiosis, fatigue, drowsiness, reduced visibility, asphyxia, deposits in eyes, dermatitis, unconsciousness, diarrhea, depression, vomiting, weakness, anesthesia, drying of nasal mucosa, edema, headache, shortness of breath, swelling and redness of skin, dizziness.

PRIMARY ROUTE(S) OF ENTRY: skin contact, ingestion, inhalation, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: skin disorders, respiratory allergies, eye disorders.

#### CHRONIC HEALTH HAZARDS:

REPEATED OVEREXPOSURE TO THIS PRODUCT MAY CAUSE: cardiac abnormalities, lung damage, blood effects, eye damage, central nervous system damage, liver abnormalities, kidney damage.

Caution: Contains isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP. Contains vinyl acetate which has been shown to cause tumors in laboratory animals by ingestion and inhalation.

NOTICE: Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

#### \*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

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#### SECTION VI - REACTIVITY DATA

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Material can be UNSTABLE under ambient conditions.

Material MAY undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: various hydrocarbons, aldehydes, oxides of carbon. fumes.

CONDITIONS TO AVOID: temperatures above 100 degrees, sparks, avoid x-rays or uv radiation, light, open flame.

MATERIALS TO AVOID: oxidizers, hydrogen peroxide, amines, liquid chlorine, polymerization catalysts, calcium hypochlorite, oxygen, alkali, sodium hypochlorite.

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#### SECTION VII - SPILL AND LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

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#### SECTION VIII - SAFE HANDLING AND USE INFORMATION

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RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Splash-proof chemical goggles should be worn.

OTHER PROTECTIVE EQUIPMENT: Impervious clothing and boots should be worn. Eye bath and safety shower should be provided.

HYGIENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

SECTION IX - SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers closed when not in use. Store away from ignition sources. All equipment should be grounded. Store in well-ventilated area. Store in a clean, dry area.

OTHER PRECAUTIONS: Empty container may retain product residues (vapor or liquid) All precautions must be observed.

This product contains the following SARA Title III, Section 313, reportable materials: xylene (mixed isomers), cumene, vinyl acetate.

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SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

ABBREVIATIONS USED IN PREPARING THIS MSDS :

HMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEIL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

374- C27-4033 SARA - 6 J.L. CLARK NAME.

00365050

NTP - National Toxicology Program

SARA - Superfund Amendments & Reauthorization Act (1986)

Don Lange

MATERIAL SAFETY DATA SHEET

MMS: H3 F3 R0 MMS: M2, D25

Date Prepared: 01/14/97

Date Revised: 01/00/97

PREPARED FOR

PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE  
(847) 872-1000 (847) 872-1000  
ZION IL 60099-1494

Emergency Phone Number:

(847) 872-1000

Information Number:

(847) 872-1000

SECTION I - PRODUCT INFORMATION

Tradename:

Product No.

Customer Part No.

374- C27-5020

4200023

Product - Class: XR3204-1 H-23 LINING

SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
1-METHYL ETHYL KETONE (MEK) (2-BUTANONE)	% by Weight 38.3 %   Cas No. 900078-93-3   Vapor Pres. 83.0 mm/Hg @ 75F   TLV-TWA 200.0 ppm   PEL-TWA 200.0 ppm   TLV-STEL 300.0 ppm 15 MINUTES   ORAL-LD50 2737. ng/Kg RAT   DERM-LD50 6480. ng/Kg RABBIT   INHAL-LC50 23500. ng/m3 RAT-8 HOUR
1-TOLUENE (TOLUOL) (METHYL BENZENE)	% by Weight 15.4 %   Cas No. 000108-88-3   Vapor Pres. 22.0 mm/Hg @ 68F   TLV-TWA 50.0 ppm   PEL-TWA 200.0 ppm   PEL-STEL 500.0 ppm 10 MINUTES   PEL-CEIL 300.0 ppm   ORAL-LD50 636. ng/Kg RAT   DERM-LD50 12305. ng/Kg RABBIT   INHAL-LC50 8000. ppm RAT-4 HOUR
EPOXY RESIN	% by Weight   Cas No. 025068-38-6   Vapor Pres.   TLV-TWA   PEL-TWA   ORAL-LD50 11400. ng/Kg RAT   DERM-LD50 >23600. ng/Kg RABBIT
1-METHOXY-2-ACETOXYPROPANE	% by Weight

Attn:  
Jim KLOTZ

	Cas No.	000108-65-6
	Vapor Pres.	3.4 mm/Hg @ 68F
	TLU-TWA	100.0 ppm
	PEL-TWA	
	ORAL-LD50	8532. ng/Kg RAT
	DERM-LD50	> 5000. ng/Kg RABBIT
ISOPHORONE	% by Weight	
	Cas No.	000078-59-1
	Vapor Pres.	1.0 mm/Hg @ 68F
	TLU-TWA	
	PEL-TWA	25.0 ppm
	TLU-CEIL	5.0 ppm
	ORAL-LD50	1870. ng/Kg RAT
	DERM-LD50	1383. ng/Kg RABBIT
	INHAL-LC50	4600. ppm 8 HOUR
MBUTYL ETHYL ACETATE	% by Weight	6.1 %
	Cas No.	000112-07-2
	Vapor Pres.	.2 mm/Hg @ 68F
	TLU-TWA	
	PEL-TWA	
	ORAL-LD50	2400. ng/Kg RAT
	DERM-LD50	1500. ng/Kg RABBIT
PHENOL RESIN	% by Weight	
	Cas No.	025068-38-6
	Vapor Pres.	
	TLU-TWA	10.0 ng/m3
	PEL-TWA	15.0 ng/m3
	ORAL-LD50	11400. ng/Kg RAT
	DERM-LD50	>23794. ng/Kg RABBIT
METHYL ISOBUTYL KETONE (MIBK) (4-METHYL-2-PENTANONE)	% by Weight	3.8 %
	Cas No.	000108-10-1
	Vapor Pres.	15.0 mm/Hg @ 68F
	TLU-TWA	50.0 ppm
	PEL-TWA	100.0 ppm
	TLU-STEL	75.0 ppm 15 MINUTES
	ORAL-LD50	2080. ng/Kg RAT
	DERM-LD50	>24950. ng/Kg RABBIT
	INHAL-LC50	2000. ppm RAT-4 HOUR
4-HYDROXY-4-METHYL-2-PENTANONE (DIACETONE ALCOHOL)	% by Weight	
	Cas No.	000123-42-2
	Vapor Pres.	.8 mm/Hg @ 68F
	TLU-TWA	50.0 ppm
	PEL-TWA	50.0 ppm
	ORAL-LD50	4000. ng/Kg RAT
	DERM-LD50	13500. ng/Kg RABBIT
PHENOL-FORMALDEHYDE RESIN	% by Weight	
	Cas No.	- -
	Vapor Pres.	
	TLU-TWA	
	PEL-TWA	

#This material is subject to reporting under SARA TITLE III, SECTION 313

All components in this product have been verified as being on the TSCA Inventory.

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

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#### SECTION III - PHYSICAL DATA

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Physical state: LIQUID

Odor and appearance:

Odor threshold (ppm): 1900

pH:

Boiling Range: 176 - 424 F ( 80 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 86.34      Lb/gal(U.S.) 7.50      SpGr: .90

UOC Data Lb/Gal(U.S.):

Less Water (EPA)      6.14      Total Organic Solvents      6.14

Less Water & Exempt (EPA)      6.14      Total Non-Exempt Solvents      6.14

Solvent Density      7.11

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#### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED)      25 F ( -3 C)      LEL .50%

Flammability Class (OSHA): FLAMMABLE LIQUID - 1B

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire.

If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

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SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

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## EFFECTS OF OVEREXPOSURE

Skin : CAUSES SKIN IRRITATION. Other effects of skin contact may include : dermatitis, dehydration

Eye : CAUSES EYE BURNS. Other effects of eye contact may include : eye damage.

Inhalation : CAUSES NOSE AND THROAT IRRITATION. MAY CAUSE LUNG INJURY AND/OR BURNS. Other effects of inhalation may include : nausea, kidney damage, dizziness, weakness, headache, anesthesia, drowsiness, fatigue, excitation, chest pain, diarrhea, CNS effects, incoordination, liver damage, blood effects, confusion.

Skin absorption : CAN BE ABSORBED THROUGH THE SKIN. Effects may include : headache, nausea, dizziness, weakness, kidney damage, incoordination, blood effects, drowsiness, liver damage.

Ingestion : HARMFUL IF SWALLOWED. Other effects of ingestion may include : gastroenteritis, abdominal pain, irritation, nausea, vomiting, diarrhea, weakness, headache, dizziness, drowsiness, fatigue, kidney damage, incoordination, CNS effects, blood effects, liver damage.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, liver conditions, kidney conditions, respiratory conditions, cardiovascular diseases.

## CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause central nervous system damage, kidney damage, liver abnormalities, lung damage, spleen damage, cardiac abnormalities, birth defects, blood effects, eye damage.

Caution. Contains isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP. Contains a phenol-formaldehyde resin which, under certain conditions, could release formaldehyde in sufficient quantities to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

## \*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.



EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

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#### SECTION VI - REACTIVITY DATA

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Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen, toxic fumes, fumes, various hydrocarbons, oxides of phosphorous, phenol, formaldehyde, aldehydes, peroxides

CONDITIONS TO AVOID: heat, open flame, sparks, dusty conditions.

MATERIALS TO AVOID: alkali, acids, oxidizers, reducing agents, amines, chlorinated solvents, aldehydes, halogenated solvents, alkanolamines, ammonia.

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#### SECTION VII - SPILL AND LEAK PROCEDURES

---

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

#### SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Face-shield should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided  
Rubber apron should be worn

HYGIENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

#### SECTION IX - SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in well-ventilated area. All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Avoid exposure to light. Avoid high temperatures and humidity. Avoid contact with fumes or hot surfaces.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues.

This product contains the following SARA Title III, Section 313, reportable materials: methyl ethyl ketone, methyl isobutyl ketone, toluene, glycol ether.

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#### SECTION X - OTHER INFORMATION

---

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Nobel Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Nobel Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, II

ABBREVIATIONS USED IN PREPARING THIS MSDS:

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Non-applicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

## # - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEIL - Ceiling Limit

## @ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SARA - Superfund Amendments &amp; Reauthorization Act (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

1.1. H2\* F3 R1

Date Prepared: 07/29/88

PREPARED-FOR:

PREPARED-BY:

01999952 HANNA CHEMICAL COATINGS  
1629 VANDERBILT RD.  
BIRMINGHAM AL 35234

HANNA CHEMICAL COATINGS CORP.  
1629 VANDERBILT ROAD  
BIRMINGHAM AL 35234

Emergency Phone Number: (205) 323-5201

Information Number: (205) 323-52

## SECTION I - PRODUCT INFORMATION

Tradename: NA

Product No. XR1215

Product - Class: WHITE TUBE ENAMEL

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	CAS No.		Occupational Exposure Limits			Vapor Pres.
			TLV	PEL	UNITS	
POLY VC/VA	09003229	15.3 %	10.	15.	mg/M3	NA
ACID MODIFIED POLY VC/VA	25085829	3.9 %	10.	15.	mg/M3	NA
1,1,1-TRICHLOROETHANE	00078591	23.9 %	5.	25.	ppm	1.0@
1,1,2-TRICHLOROETHANE (XYLOL)	01330207	52.6 %	100.	100.	ppm	5.1@
(MIXED DIMETHYL BENZENES)						
METHYL ISOBUTYL KETONE (MIBK)	00108101	1.0 %	50.	100.	ppm	15.0@
(4-METHYL-2-PENTANONE)						
PROPYLENE OXIDE	00075569	.5 %	20.	100.	ppm	442.0@

## SECTION III - PHYSICAL DATA

Boiling Range: 94 - 424 F Vapor is heavier than Air.

Evaporation rate is slower than ether. % Volatile (vol) 85.50 wt/gal 8.07

## SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

FP -35 F LEL .80% Flammability Class (OSHA): FLAMMABLE LIQUID - 1A

Extinguishing Media: Foam, Carbon dioxide or dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARD: During emergency conditions, overexposure to decomposition products (See section VI - reactivity data) may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

Keep containers tightly closed. Isolate from heat, spark and open flame. Closed containers may explode when exposed to extreme heat.

AL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog-nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect fire fighters from exposure to coating's hazardous ingredients and hazardous combustion products.

---

#### SECTION V - HEALTH HAZARD DATA

---

EFFECTS OF OVEREXPOSURE: HARMFUL IF INHALED. IRRITATING TO EYES, SKIN AND RESPIRATORY TRACT.

OTHER SYMPTOMS MAY INCLUDE: dizziness, nausea, headache, anesthesia, vomiting.

MEDICAL CONDITION THAT CAN BE AGGRAVATED: pulmonary conditions.

CHRONIC HEALTH HAZARD: Caution: Contains propylene oxide which caused cancer in laboratory animals by inhalation and is listed as a suspect carcinogen by IARC(GROUP\_2B). Contains Isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP.

REPEATED OVEREXPOSURE TO THIS PRODUCT MAY CAUSE: kidney damage, liver abnormalities, lung damage, cardiac abnormalities, blood effects, eye damage.

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

EMERGENCY AND FIRST AID PROCEDURES: In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. If affected by inhalation of vapor or spray mist, remove to fresh air. If swallowed get medical attention.

---

#### SECTION VI - REACTIVITY DATA

---

MATERIAL IS STABLE UNDER NON-EMERGENCY CONDITIONS.

HAZARDOUS POLYMERIZATION MAY OCCUR.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of carbon, hydrogen chloride, toxic fumes, various hydrocarbons.

CONDITIONS TO AVOID: heat, open flame, sparks.

RIALS TO AVOID: alkali, oxidizers, amines, acids.

---

SECTION VII - SPILL AND LEAK PROCEDURES

---

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in section VIII; assume for all Hazardous ingredients listed in section II, that TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHOD: Dispose of in accordance with Federal, State and local regulations.

---

SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during and after application unless air monitoring demonstrates vapor/mist levels are below application limits. Follow respirator manufacturer's directions for respirator use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits, as listed in section II.

PROTECTIVE GLOVES: Protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

PROTECTION: Safety glasses with side shields should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGIENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

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SECTION IX - SPECIAL PRECAUTIONS

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep containers closed when not in use. Store away from ignition sources. Store in well ventilated area. Store below 100 degrees Fahrenheit.

OTHER PRECAUTIONS: Empty container may retain product residues (vapor or liquid). All precautions must be observed. All equipment should be grounded.

DISCLAIMER: While HANNA CHEMICAL COATINGS CORP. believes that the data contained herein are accurate and derived from qualified sources the data are not to be taken as a warranty or representation for which HANNA CHEMICAL COATINGS CORP. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

Dec

# MATERIAL SAFETY DATA SHEET

HMIS H2* F2 R0	WHMIS: B3;D2A	Date Prepared:	06/21/94
		Date Revised:	10/12/93
PREPARED FOR:		PREPARED BY:	
365050	J.L.CLARK-DOWNERS GROVE	AKZO NOBEL COATINGS INC.-ZION	
	2300 WISCONSIN AVE.	1915 INDUSTRIAL AVENUE	
		(708)872-1000	(708)872-1000
	DOWNERS GROVE IL 60515	ZION IL 60099-1494	
Emergency Phone Number:		(708) 872-1000	
Information Number:		(708) 872-1000	

## SECTION I - PRODUCT INFORMATION

Tradename:	Product No.	Customer Part No.
NA	375- 227-5048	
Product - Class: XB2666 ALUMINUM TUBE ENAMEL		

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data			
ISOPHORONE	1% by Weight			
	ICas No.	000078-59-1		
	IVapor Pres.	1.0@ 68F mm/Hg		
	ITLU-TWA	5.0	ppm	
	IPEL-TWA	25.0	ppm	
	IORAL-LD50	2330.	mg/Kg RAT	
	IDERM-LD50	1500.	mg/Kg RABBIT	
AROMATIC SOLVENT	1% by Weight			
	ICas No.	-		
	IVapor Pres.	NA		
	ITLU-TWA	100.0	ppm	
	IPEL-TWA	NA		
1,2,4-TRIMETHYLBENZENE	1% by Weight 6.5 %			
	ICas No.	000095-63-6		
	IVapor Pres.	NA		
	ITLU-TWA	25.0	ppm	
	IPEL-TWA	25.0	ppm	
	Inhalation	18000.	mg/m3 RAT-4 HOUR	
	VINYL ACETATE	1% by Weight .1 %		
ICas No.		000108-05-4		
IVapor Pres.		88.0@ 68F mm/Hg		
ITLU-TWA		10.0	ppm	
IPEL-TWA		10.0	ppm	
ITLU-STEEL		20.0	ppm 15 MINUTES	
IPEL-STEEL		20.0	ppm 15 MINUTES	
IORAL-LD50		2900.	mg/Kg RAT	
IDERM-LD50	2400.	mg/Kg RABBIT		

Inhalation &gt; 4000. ppm RAT-8 HOUR

This material is subject to reporting under SARA TITLE III, SECTION 313  
All components in this coating have been verified as being on the TSCA Inventory

## SECTION III - PHYSICAL DATA

Physical state: LIQUID  
Odor and appearance: NA  
Odor threshold (ppm): .1900  
pH: NA

Boiling Range: 305 - 424 F ( 151 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 70.67

Lb/gal(U.S.) 8.31

SpGr: .99

VOC Data Lb/Gal(U.S.):

Less Water (EPA)

5.31

Total Organic Solvents

5.29

Less Water &amp; Exempt (EPA)

5.31

Total Non-Exempt Solvents

5.29

Solvent Density

7.5290

## SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

FP: (CLOSED) 105 F ( 40 C) LEL .80%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure  
to decomposition products (See Section VI - Reactivity Data) may cause a  
health hazard; symptoms may not be immediately apparent. Obtain medical  
attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire.  
If water is used to cool closed containers to prevent pressure build-up,  
fog nozzles are preferred. Full protective equipment, including  
self-contained breathing apparatus is needed to protect firefighters  
from exposure to coating's hazardous ingredients and hazardous  
decomposition products.



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SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

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EFFECTS OF OVEREXPOSURE: CAUSES EYE IRRITATION. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. CAUSES SKIN IRRITATION. MAY CAUSE LUNG IRRITATION. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: dizziness, nausea, headache, pneumoconiosis, drying of nasal mucosa, depression, fatigue, vomiting, weakness, asphyxia, gastritis, shortness of breath, unconsciousness, reduced visibility, deposits in eyes, dermatitis, diarrhea.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: NA.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: kidney damage, liver abnormalities, lung damage, cardiac abnormalities, blood effects, eye damage.

CAUTION: Contains isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP. Contains vinyl acetate which has been shown to cause tumors in laboratory animals by ingestion and inhalation.

WARNING: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*.

SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

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SECTION VI - REACTIVITY DATA

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Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, fumes, various hydrocarbons, aldehydes, acrylic monomers.

CONDITIONS TO AVOID: heat, open flame, sparks.

MATERIALS TO AVOID: alkali, oxidizers, amines.

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SECTION VII - SPILL AND LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

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SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Splash-proof chemical goggles should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

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SECTION IX - SPECIAL PRECAUTIONS

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: vinyl acetate, trimethylbenzene.

This product contains the following substance(s) listed by the U.S. EPA as Hazardous Air Pollutants: isophorone.

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SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, III

ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

Fahrenheit

- Greater Than < - Less Than

% - Percent

lb - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEL - Ceiling Limit

At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTTP - National Toxicology Program

SARA - Superfund Amendments & Reauthorization Act (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HMIS H2\* F2 R2 WHMIS: 83;D2A

Date Prepared: 11/14/94

Date Revised : 10/17/94

## PREPARED FOR:

## PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000  
ZION IL 60099-1494

DONNERS GROVE IL 60515

Emergency Phone Number:

(708) 872-1000

Information Number:

(708) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:

Product No.

Customer Part No.

NA

375- E27-0006

Product - Class: ALUMINUM ADDITIVE

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
ISOPHORONE	% by Weight  Cas No. 000078-59-1  Vapor Pres. 1.0@ 68F mm/Hg  TLV-TWA 5.0 ppm  PEL-TWA 25.0 ppm  ORAL-LD50 2330. ng/Kg RAT  DERM-LD50 1500. ng/Kg Rf.BBIT 
AROMATIC SOLVENT	% by Weight  Cas No. - -  Vapor Pres. NA  TLV-TWA 100.0 ppm  PEL-TWA NA 
#1,2,4-TRIMETHYLBENZENE	% by Weight 8.7 %  Cas No. 000095-63-6  Vapor Pres. NA  TLV-TWA 25.0 ppm  PEL-TWA 25.0 ppm  Inhalation 18000. ng/m3 RAT-4 HOUR 
#ALUMINUM	% by Weight 1.6 %  Cas No. 007429-90-5  Vapor Pres. NA  TLV-TWA 10.0 ng/m3  PEL-TWA 15.0 ng/m3 
#XYLENE, MIXED ISOMERS	% by Weight 1.3 %  Cas No. 001330-20-7  Vapor Pres. 5.1@ 68F mm/Hg

TLV-TWA	100.0	ppm	
PEL-TWA	100.0	ppm	
TLV-STEL	150.0	ppm	15 MINUTES
PEL-STEL	150.0	ppm	15 MINUTES
ORAL-LD50	4300.	ng/Kg	RAT
inhalation	5000.	ppm	RAT-4 HOUR

#This material is subject to reporting under SARA TITLE III, SECTION 313  
All components in this coating have been verified as being on the TSCA Inventory

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### SECTION III - PHYSICAL DATA

---

Physical state: LIQUID  
Odor and appearance: NA  
Odor threshold (ppm): .1900  
pH: NA

Boiling Range: 300 - 424 F ( 148 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 59.36      Lb/gal(U.S.) 8.11      SpGr: .97

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	4.41	Total Organic Solvents	4.41
Less Water & Exempt (EPA)	4.41	Total Non-Exempt Solvents	4.41

Solvent Density                      7.4290

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### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED)    105 F (    40 C)    LEL .80%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire.

If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

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SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE: CAUSES EYE IRRITATION. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: dizziness, nausea, headache, pneumoconiosis, drying of nasal mucosa, depression, fatigue, vomiting, weakness, asphyxia, gastritis, shortness of breath, unconsciousness, reduced visibility, deposits in eyes, dermatitis, diarrhea.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: kidney damage, liver abnormalities, lung damage, cardiac abnormalities, blood effects, eye damage.

Caution: Contains isophorone which has been shown to cause cancer in laboratory animals by ingestion and is listed as a suspect carcinogen by NTP.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*.

SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

---

SECTION VI - REACTIVITY DATA

---

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, fumes, various hydrocarbons, aldehydes, acrylic monomers.

CONDITIONS TO AVOID: heat, open flame, sparks.

MATERIALS TO AVOID: alkali, acids, oxidizers, amines, halogen compounds, phosphorus, hydrogen peroxide, nitrates, nitrites, bromine.

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#### SECTION VII - SPILL AND LEAK PROCEDURES

---

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

#### SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Splash-proof chemical goggles should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

#### SECTION IX - SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area. DO NOT ALLOW TO FREEZE.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: xylene (mixed isomers), aluminum, trimethylbenzene.



This product contains the following substance(s) listed by the U.S. EPA as Hazardous Air Pollutants: isophorone, xylene.

---

SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, IIIS, 3, UN1993, II3.150

ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEIL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SARA - Superfund Amendments & Reauthorization Act (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HAZID: H3 F2 G0 HUID: B7-02P Date Prepared: 04/16/92  
Date Revised: 01/01/93

## PREPARED FOR:

## PREPARED BY:

365050 J.L. CLARK MFG.  
2300 WINDSORCH AVE.  
DOWNERS GROVE IL 60515  
AKZO NOBEL POLYMERS INC-TIO9  
1915 INDUSTRIAL AVENUE  
(847) 972-1000 (847) 972-1000  
ZION IL 60099-1494

Emergency Phone Number: (847) 972-1000  
Information Number: (847) 972-1000

## SECTION I - PRODUCT INFORMATION

Tradename: Product No. Customer Part No.  
222-827-2012 412000

Product - Class: J.L.C. 0001

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
TITANIUM DIOXIDE	% by Weight CAS No. 01308-01-7

Vapor Pres.	
HLU-TWA	10.0 mg/m3
PFL-TWA	15.0 mg/m3

## AROMATIC SOLVENT

% by Weight	
CAS No.	
Vapor Pres.	
HLU-TWA	100.0 ppm
PFL-TWA	

## METHYLATED RVE RESIN

% by Weight	
CAS No.	00009-20-1
Vapor Pres.	
HLU-TWA	
PFL-TWA	
HLU-TWA	12000 mg/m3
PFL-TWA	>10000 mg/m3

## SWAMP TAILING

% by Weight	2.3%
CAS No.	000001-00-1
Vapor Pres.	
HLU-TWA	10.0 ppm
PFL-TWA	10.0 ppm
HLU-TWA	15.0 ppm
PFL-TWA	20.0 ppm
HLU-TWA	450.0 mg/m3
PFL-TWA	450.0 mg/m3
HLU-TWA	700.0 mg/m3
PFL-TWA	700.0 mg/m3



Vapor is heavier than air

Evaporation rate is slower than ether

Wettable (sol) 38.31

lb/gal (U.S.) 11.31

Wettable (sol) 38.31

UOC Rate (lb/gal (U.S.))

Less Water (EPA) 2.89 Total Organic Solvents 2.89

Less Water & Exempt (EPA) 2.86 Total Non-Exempt Solvents 2.86

Solvent Density 7.53

#### SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FP: (CLOSED) 118 F ( 47 C) LEL 1.00%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

#### SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

##### EFFECTS OF OVEREXPOSURE :

Skin : CAUSES SKIN IRRITATION. Other effects : Skin contact may include dermatitis.

Eye : MAY CAUSE EYE BURNS

Inhalation : MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE LUNG IRRITATION. Other effects of inhalation may include : wheezing, cough, shortness of breath, dehydration, dizziness, weakness, headache, fatigue, depression.

Skin absorption : CAN BE ABSORBED THROUGH THE SKIN. Effects may include : CNS effects.

Ingestion : HARMFUL IF CHELONED. Other effects of ingestion may include : abdominal pain, gastric disturbances, nausea, vomiting, diarrhea, weakness, headache, dizziness, fatigue, CNS effects, depression.

PRIMARY ROUTE(S) OF ENTRY: Inhalation, skin contact, ingestion, eyes

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, respiratory conditions

#### CHRONIC HEALTH HAZARDS

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, cardiac abnormalities, blood effects.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

#### EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY

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#### SECTION VI - REACTIVITY DATA

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Material is STABLE under non-emergency conditions

Material WILL NOT undergo hazardous polymerization

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen, toxic fumes, fumes, various hydrocarbons, ammonia, formaldehyde, aldehydes, acids, methanol, aluminum oxide, styrene, ethyl alcohol, nitrogen compounds, ethanol.

CONDITIONS TO AVOID: temperatures above 120 degrees, open flame, sparks, dusty conditions.

MATERIALS TO AVOID: acids, oxidizers, water, aldehydes, isocyanates, esters, organic halides.

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**SECTION VII - SPILL AND LEAK PROCEDURES**

---

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

**SECTION VIII - SAFE HANDLING AND USE INFORMATION**

---

**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

**EYE PROTECTION:** Face-shield should be worn.

**OTHER PROTECTIVE EQUIPMENT:** Eye bath and safety shower should be provided. Rubber apron should be worn.

**HYGIENIC PRACTICES:** Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

**SECTION IX - SPECIAL PRECAUTIONS**

---

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Store in well-ventilated area. All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store below 120 degrees Fahrenheit. Store away from ignition sources. Avoid dusty conditions.

**OTHER PRECAUTIONS:** All precautions must be observed. Empty container may retain product residues.

This product contains the following CAS# (Title III, Section 113, reportable materials): xylene (mixed isomer), naphthalene, triethylbenzene

SECTION 3 - OTHER INFORMATION

The absence of a negative finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Nobel Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Nobel Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, III

ABBREVIATIONS USED IN PREPARING THIS MSDS

HMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Non-applicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

LD50 - Oral Lethal Dose (50% Dose)

IMHAL-1000 - Inhalation Lethal Concentration (50% Death)

DERM-1000 - Dermal Lethal Dose (50% Death)

SEL - Soluble Solids Limit

HLV - Inhalation Limit Value

STEL - Short Term Exposure Limit

CEL - Ceiling Limit

g - Gram

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

CFR - Code of Federal Regulations (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HMIS H3 F2 R1 WHMIS: B3/D2D Date Prepared: 01/03/95  
Date Revised : 12/31/94

PREPARED FOR:

PREPARED BY:

363050 JL CLARK/DOWNERS GROVE  
2300 WISCONSIN AVE.

AKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE  
(708)872-1000 (708)872-1000

DOWNERS GROVE IL 60515

ZION IL 60099-1494

Emergency Phone Number:

(708) 872-1000

Information Number:

(708) 872-1000

2001  
JAN

## SECTION I - PRODUCT INFORMATION

Tradename:  
NA

Product No.  
222- V27-2008

Customer Part No.

Product - Class: L.F. BRIGHT YELLOW

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
TITANIUM DIOXIDE	[% by Weight [Cas No. 013463-67-7 [Vapor Pres. NA [TLV-TWA 10.0 ng/m3 [PEL-TWA 15.0 ng/m3 
AROMATIC SOLVENT	[% by Weight [Cas No. - - [Vapor Pres. NA [TLV-TWA 100.0 ppm [PEL-TWA NA 
MELAMINE-FORMALDEHYDE RESIN	[% by Weight [Cas No. - - [Vapor Pres. NA [TLV-TWA NA [PEL-TWA NA 
METHYLATED M/F RESIN	[% by Weight [Cas No. 068002-20-0 [Vapor Pres. NA [TLV-TWA NA [PEL-TWA NA 
ALPHA-HYDROXY TOLUENE	[% by Weight [Cas No. 000100-51-6 [Vapor Pres. .1@ 86F mm/Hg [TLV-TWA NA [PEL-TWA NA [ORAL-LO50 1230. mg/Kg RAT



	DERM-LD50	2000.	ng/Kg	RABBIT
	Inhalation	1000.	ppm	RAT-8 HOUR
ANAPHTHALENE	% by Weight	1.9 %		
	Cas No.	000091-20-3		
	Vapor Pres.	< .1@ 68F	mm/Hg	
	TLV-TWA	10.0	ppm	
	PEL-TWA	10.0	ppm	
	TLV-STEL	15.0	ppm	30 MINUTES
	PEL-STEL	15.0	ppm	30 MINUTES
	ORAL-LD50	1250.	ng/Kg	RAT
ALUMINUM OXIDE	% by Weight			
	Cas No.	001344-28-1		
	Vapor Pres.	NA		
	TLV-TWA	10.0	ng/m3	
	PEL-TWA	15.0	ng/m3	

#This material is subject to reporting under SARA TITLE III, SECTION 313  
 All components in this coating have been verified as being on the TSCA Inventory

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#### SECTION III - PHYSICAL DATA

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Physical state: LIQUID  
 Odor and appearance: NA  
 Odor threshold (ppm): .0380  
 pH: NA

Boiling Range: 305 - 410 F ( 151 - 210 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol)	36.16	Lb/gal(U.S.)	11.27	SpGr:	1.35
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VOC Data Lb/Gal(U.S.):

Less Water (EPA)	2.75	Total Organic Solvents	2.75
Less Water & Exempt (EPA)	2.75	Total Non-Exempt Solvents	2.75

Solvent Density	7.6110
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#### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP. (CLOSED) 109 F ( 42 C) LEL .80%  
 Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2  
 This is the OSHA classification, DOT may be different

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products. Keep containers tightly closed. Isolate from heat, sparks and open flame. Closed containers may explode when exposed to extreme heat.

---

#### SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE: MAY CAUSE EYE BURNS. HARMFUL IF SWALLOWED. MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE DELAYED SKIN REACTIONS. CAUSES SKIN IRRITATION. MAY CAUSE LUNG INJURY. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM, CAUSING DIZZINESS, HEADACHE OR NAUSEA. HARMFUL IF INHALED.

Other effects of OVEREXPOSURE may include: narcosis, pneumoconiosis, drying of nasal mucosa, fatigue, vomiting, cough, weakness, asphyxia, gastritis, shortness of breath, unconsciousness, inflammation of the mucous membranes of the nose and throat, reduced visibility, deposits in eyes, dermatitis, dehydration to skin, abdominal pain.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders, eye disorders, respiratory allergies.

#### CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, cardiac abnormalities, blood effects.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

#### \*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give

oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

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#### SECTION VI - REACTIVITY DATA

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Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen, toxic fumes, fumes, various hydrocarbons, ammonia, formaldehyde, aldehydes, methanol, ethanol.

CONDITIONS TO AVOID: temperatures above 100 degrees, open flame, sparks, dusty conditions.

MATERIALS TO AVOID: alkali, acids, oxidizers, chlorine trifluoride.

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#### SECTION VII - SPILL AND LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assure for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

WASTE DISPOSAL METHODS: Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

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#### SECTION VIII - SAFE HANDLING AND USE INFORMATION

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RESPIRATORY PROTECTION: Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

VENTILATION: Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

PROTECTIVE GLOVES: Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

EYE PROTECTION: Face-shield should be worn.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower should be provided. Rubber apron should be worn.

HYGIENIC PRACTICES: Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

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## SECTION IX - SPECIAL PRECAUTIONS

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store away from ignition sources. Store in well-ventilated area. Use oldest inventory first. Store away from open flame.

OTHER PRECAUTIONS: All precautions must be observed. Empty container may retain product residues (vapor or liquid).

This product contains the following SARA Title III, Section 313, reportable materials: naphthalene.

This product contains the following substance(s) listed by the U.S. EPA as Hazardous Air Pollutants: naphthalene.

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## SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, IIIUM1760, III

ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Nonapplicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit  
CEL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SHA - Superfund Amendments & Reauthorization Act (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HMIS: H2\* F2 R0    HMIS: B3; D2B

Date Prepared: 03/12/97

Date Revised: 01/04/97

PREPARED FOR:

PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO NOBEL CONTINUES INC-ZION  
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(847) 872-1000 (847) 872-1000  
ZION IL 60099-1494

DOWNERS GROVE IL 60515

Emergency Phone Number:

(847) 872-1000

Information Number:

(847) 872-1000

Attn:  
Jim Klotz  
Updated MSDS

## SECTION I - PRODUCT INFORMATION

Tradename:

Product No.  
375- W27-5026

Customer Part No.

Product - Class: WHITE TUBE ENAMEL

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
ISOPHORONE	% by Weight Cas No. 000078-59-1 Vapor Pres. 1.0 mm/Hg @ 68F TLV-TWA PEL-TWA 25.0 ppm TLV-CEIL 5.0 ppm ORAL-LD50 1970. mg/Kg RAT DERM-LD50 1383. mg/Kg RABBIT INHAL-LC50 4600. ppm 8 HOUR
TITANIUM DIOXIDE	% by Weight Cas No. 013463-67-7 Vapor Pres. TLV-TWA 10.0 mg/m3 PEL-TWA 15.0 mg/m3
AROMATIC SOLVENT	% by Weight Cas No. - - Vapor Pres. TLV-TWA 100.0 ppm PEL-TWA
#1,2,4-TRIMETHYLBENZENE	% by Weight 4.2 % Cas No. 000095-63-6 Vapor Pres. TLV-TWA 25.0 ppm PEL-TWA 25.0 ppm ORAL-LD50 5000. mg/Kg RAT INHAL-LC50 18000. mg/m3 RAT-4 HOUR

POLY VC/VA COPOLYMER	% by Weight	
	Cas No.	009003-22-9
	Vapor Pres.	
	TLU-TWA	10.0 ng/n3
	PEL-TWA	10.0 ng/n3
UREA-FORMALDEHYDE RESIN	% by Weight	
	Cas No.	- -
	Vapor Pres.	
	TLU-TWA	
	PEL-TWA	
#BUTANOL (BUTYL ALCOHOL)	% by Weight	1.1 %
	Cas No.	000071-36-3
	Vapor Pres.	5.5 mm/Hg @ 68F
	TLU-TWA	
	PEL-TWA	100.0 ppm
	TLU-CEIL	50.0 ppm
	ORAL-LD50	790. mg/Kg RAT
	DERM-LD50	3400. mg/Kg RABBIT
	INHAL-LC50	8000. ppm RAT-4 HOUR
ALUMINA TRIMHYDROXIDE	% by Weight	
	Cas No.	021645-51-2
	Vapor Pres.	
	TLU-TWA	10.0 ng/n3
	PEL-TWA	15.0 ng/n3
#NAPHTHALENE	% by Weight	1.0 %
	Cas No.	000091-20-3
	Vapor Pres.	< .1 mm/Hg @ 68F
	TLU-TWA	10.0 ppm
	PEL-TWA	10.0 ppm
	TLU-STEL	15.0 ppm 30 MINUTES
	ORAL-LD50	490. mg/Kg RAT
	DERM-LD50	20000. mg/Kg RABBIT
	INHAL-LC50	> 340. mg/n3 RAT-1 HOUR
#XYLENE, MIXED ISOMERS	% by Weight	1.0 %
	Cas No.	001330-20-7
	Vapor Pres.	5.1 mm/Hg @ 68F
	TLU-TWA	100.0 ppm
	PEL-TWA	100.0 ppm
	TLU-STEL	150.0 ppm 15 MINUTES
	ORAL-LD50	4300. mg/Kg RAT
	DERM-LD50	> 1700. mg/Kg RABBIT
	INHAL-LC50	5000. ppm RAT-4 HOUR

\*This material is subject to reporting under SARA TITLE III, SECTION 313

All components in this product have been verified as being on the TSCA Inventory.

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

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SECTION III - PHYSICAL DATA

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Physical state: LIQUID  
Odor and appearance:  
Odor threshold (ppm): .0380  
pH:

Boiling Range: 212 - 424 F ( 100 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 70.09      Lb/gal(U.S.)10.04      SpGr: 1.20

VOC Data Lb/Gal(U.S.):

Less Water (EPA)	5.25	Total Organic Solvents	5.25
Less Water & Exempt (EPA)	5.25	Total Non-Exempt Solvents	5.24

Solvent Density                      7.49

---

SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED)    110 F ( 43 C)    LEL .80%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire.

If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE :

Skin : CAUSES SKIN IRRITATION. Other effects of skin contact may include : dermatitis, dehydration.

Eye : CAUSES EYE IRRITATION.

Inhalation : MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE LUNG IRRITATION. Other effects of inhalation may include : nausea, shortness of breath, dehydration, dizziness, weakness, headache, drowsiness,



## MATERIAL SAFETY DATA SHEET

HMIS: H3 F2 NO    HHMIS: D3;D2R

Date Prepared: 11/26/96

Date Revised : 10/01/96

## PREPARED FOR:

## PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVEAKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE  
(847)872-1000 (847)872-1000  
ZION IL 60099-1494

DOWHERS GROVE IL 60515

Emergency Phone Number:

(847) 872-1000

Information Number:

(847) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:

Product No.  
222- V27-0008

Customer Part No.

Product - Class: POLYESTER PMS 474C

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data
TITANIUM DIOXIDE	% by Weight Cas No. 013463-67-7 Vapor Pres. TLV-TWA 10.0 ng/m3 PEL-TWA 15.0 ng/m3 
AROMATIC SOLVENT	% by Weight Cas No. - - Vapor Pres. TLV-TWA 100.0 ppm PEL-TWA 
METHYLATED M/F RESIN	% by Weight Cas No. 068002-20-0 Vapor Pres. TLV-TWA PEL-TWA ORAL-LD50 12300 ng/Kg RAT DERM-LD50 >10000 ng/Kg RABBIT 
1-NAPHTHALENE	% by Weight 2.2 % Cas No. 000091-20-3 Vapor Pres. < .1 mm/Hg @ 68F TLV-TWA 10.0 ppm PEL-TWA 10.0 ppm TLV-STEL 15.0 ppm 30 MINUTES ORAL-LD50 490 ng/Kg RAT DERM-LD50 20000 ng/Kg RABBIT INHAL-LC50 > 340 ng/m3 RAT-1 HOUR 

XYLENE, MIXED ISOMERS	% by Weight	2.2 %
	Cas No.	001330-20-7
	Vapor Pres.	5.1 mm/Hg @ 68F
	TLV-TWA	100.0 ppm
	PEL-TWA	100.0 ppm
	TLV-STEL	150.0 ppm 15 MINUTES
	ORAL-LD50	4300. ng/Kg RAT
	DERM-LD50	> 1700. ng/Kg RABBIT
	INHAL-LC50	5000. ppm RAT-4 HOUR
STYRENE/ALLYL ALCOHOL RESIN	% by Weight	
	Cas No.	025119-62-4
	Vapor Pres.	
	TLV-TWA	10.0 ng/m3
	PEL-TWA	15.0 ng/m3
	ORAL-LD50	25000. ng/Kg RAT
	DERM-LD50	10000. ng/Kg RABBIT
#1,2,4-TRIMETHYLBENZENE	% by Weight	1.9 %
	Cas No.	000095-63-6
	Vapor Pres.	
	TLV-TWA	25.0 ppm
	PEL-TWA	25.0 ppm
	ORAL-LD50	5000. ng/Kg RAT
	INHAL-LC50	18000. ng/m3 RAT-4 HOUR
ALUMINA TRIHYDROXIDE	% by Weight	
	Cas No.	021645-51-2
	Vapor Pres.	
	TLV-TWA	10.0 ng/m3
	PEL-TWA	15.0 ng/m3
ALPHA-HYDROXY TOLUENE	% by Weight	
	Cas No.	000100-51-6
	Vapor Pres.	.1 mm/Hg @ 86F
	TLV-TWA	
	PEL-TWA	
	ORAL-LD50	1230. ng/Kg RAT
	DERM-LD50	2000. ng/Kg RABBIT
	INHAL-LC50	1000. ppm RAT-8 HOUR

#This material is subject to reporting under SARA TITLE III, SECTION 313

All components in this product have been verified as being on the TSCA Inventory.

---

### SECTION III - PHYSICAL DATA

---

Physical state: LIQUID

Odor and appearance:

Odor threshold (ppm): .0380

pH:

Boiling Range: 277 - 424 F ( 136 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 39.54      Lb/gal(U.S.)11.73      SpGr: 1.40

VOC Data Lb/Gal(U.S.):

Less Water (EPA)                      2.98    Total Organic Solvents                      2.97

Less Water & Exempt (EPA)            2.98    Total Non-Exempt Solvents                      2.97

Solvent Density                      7.53

---

#### SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED)    118 F (    47 C)    LEL 1.00%

Flammability Class (OSHA): COMBUSTIBLE LIQUID - 2

This is the OSHA classification, DOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire.

If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

#### SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE :

Skin : CAUSES SKIN IRRITATION. Other effects of skin contact may include : dermatitis.

Eye : MAY CAUSE EYE BURNS.

Inhalation : MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE LUNG IRRITATION. Other effects of inhalation may include : nausea, cough, shortness of breath, dehydration, dizziness, weakness, headache, fatigue, depression.

Skin absorption : CAN BE ABSORBED THROUGH THE SKIN. Effects may include : CNS effects.

Ingestion : HARMFUL IF SWALLOWED. Other effects of ingestion may include : abdominal pain, gastric disturbances, nausea, vomiting, diarrhea, weakness, headache, dizziness, fatigue, CNS effects, depression.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, cardiac abnormalities, blood effects.

Caution: Contains a melamine-formaldehyde resin which, under certain conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

SKIN CONTACT: Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

EYE CONTACT: Flush with water for at least 15 minutes and get medical attention.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

INGESTION: Get medical attention IMMEDIATELY.

---

SECTION VI - REACTIVITY DATA

---

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

HAZARDOUS DECOMPOSITION PRODUCTS: oxides of carbon, oxides of nitrogen, hydrogen chloride, toxic fumes, fumes, various hydrocarbons, ammonia, formaldehyde, aldehydes, acids, methanol, acrylic monomers, styrene, allyl alcohol, nitrogen compounds, ethanol.

CONDITIONS TO AVOID: temperatures above 120 degrees, open flame, sparks, dusty conditions.

MATERIALS TO AVOID: acids, oxidizers, water, aldehydes, isocyanates, esters, organic halides.

---

## SECTION VII - SPILL AND LEAK PROCEDURES

---

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

## SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

**EYE PROTECTION:** Face-shield should be worn.

**OTHER PROTECTIVE EQUIPMENT:** Eye bath and safety shower should be provided. Rubber apron should be worn.

**HYGIENIC PRACTICES:** Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

## SECTION IX - SPECIAL PRECAUTIONS

---

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Store in well-ventilated area. All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store below 120 degrees Fahrenheit. Store away from ignition sources. Avoid dusty conditions.

**OTHER PRECAUTIONS:** All precautions must be observed. Empty container may retain product residues.

This product contains the following SARA Title III, Section 313, reportable materials: xylene (mixed isomers), naphthalene, triethylbenzene.

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## SECTION X - OTHER INFORMATION

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The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

Disclaimer: While Akzo Nobel Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Nobel Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

DOT Proper Shipping Classification - Paint, 3, UN1263, III

ABBREVIATIONS USED IN PREPARING THIS MSDS :

WHMIS - Workplace Hazardous Materials Information System

ISCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

lb/gal - Pounds Per Gallon

NA - Not Available or Non-applicable

mg/L - Milligrams Per Liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

> - Greater Than      < - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

DERM-LD50 - Dermal Lethal Dose (50% Death)

PEL - Permissible Exposure Limit

TLV - Threshold Limit Value

STEL - Short Term Exposure Limit

CEL - Ceiling Limit

@ - At

OSHA - Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

NTP - National Toxicology Program

SARA - Superfund Amendments & Reauthorization Act (1986)

DOT - Department of Transportation

# MATERIAL SAFETY DATA SHEET

HMIS: H2 F3 R1    HHMIS: B2;D1B

Date Prepared: 03/22/97

Date Revised: 03/12/97

PREPARED FOR:

PREPARED BY:

365050 J.L. CLARK MANU.  
2300 WISCONSIN AVE.

AKZO NOBEL COATINGS INC-ZION  
1915 INDUSTRIAL AVENUE

DOWNERS GROVE IL 60515

(847) 872-1000 (847) 872-1000

ZION IL 60099-1494

Emergency Phone Number:

(847) 872-1000

Information Number:

(847) 872-1000

## SECTION I - PRODUCT INFORMATION

Tradename:

Product No.

Customer Part No.

JLC2841-H

Product - Class: OLD COPPER TUBE ENAMEL

## SECTION II - HAZARDOUS INGREDIENTS

Hazardous Ingredients	Ingredient Data		
AROMATIC SOLVENT	% by Weight		
	{Cas No. - -		
	{Vapor Pres.		
	{TLV-TWA	100.0	ppm
	{PEL-TWA		
N2-BUTOXYETHANOL (ETHYLENE GLYCOL BUTYL ETHER)	% by Weight 14.2 %		
	{Cas No. 000111-76-2		
	{Vapor Pres. .6 mm/Hg @ 68F		
	{TLV-TWA	25.0	ppm
	{PEL-TWA	50.0	ppm
	{ORAL-LD50	470.	mg/Kg RAT
	{DERM-LD50	220.	mg/Kg RABBIT
METHYLATED M/F RESIN	{INHAL-LC50 450. ppm RAT-4 HOUR		
	% by Weight		
	{Cas No. 068002-20-0		
	{Vapor Pres.		
	{TLV-TWA		
STYRENE/ALLYL ALCOHOL RESIN	{PEL-TWA		
	{ORAL-LD50	12300.	mg/Kg RAT
	{DERM-LD50	>10000.	mg/Kg RABBIT
	% by Weight		
	{Cas No. 025119-62-4		
	{Vapor Pres.		
	{TLV-TWA	10.0	mg/m3
	{PEL-TWA	15.0	mg/m3
	{ORAL-LD50	25000.	mg/Kg RAT
	{DERM-LD50	10000.	mg/Kg RABBIT

Attn:  
Jim Klotz  
Updated MSDS

## #NAPHTHALENE

% by Weight 3.6 %  
 Cas No. 000091-20-3  
 Vapor Pres. < .1 mm/Hg @ 68F  
 TLV-TWA 10.0 ppm  
 PEL-TWA 10.0 ppm  
 TLV-STEL 15.0 ppm 30 MINUTES  
 ORAL-LD50 490. mg/Kg RAT  
 DERM-LD50 20000. mg/Kg RABBIT  
 INHAL-LC50 > 340. mg/m3 RAT-1 HOUR

## #XYLENE, MIXED ISOMERS

% by Weight 1.8 %  
 Cas No. 001330-20-7  
 Vapor Pres. 5.1 mm/Hg @ 68F  
 TLV-TWA 100.0 ppm  
 PEL-TWA 100.0 ppm  
 TLV-STEL 150.0 ppm 15 MINUTES  
 ORAL-LD50 4300. mg/Kg RAT  
 DERM-LD50 > 1700. mg/Kg RABBIT  
 INHAL-LC50 5000. ppm RAT-4 HOUR

## #ALUMINUM

% by Weight 1.2 %  
 Cas No. 007429-90-5  
 Vapor Pres.  
 TLV-TWA 10.0 ng/m3  
 PEL-TWA 15.0 ng/m3

#This material is subject to reporting under SARA TITLE III, SECTION 313

All components in this product have been verified as being on the TSCA Inventory.

\* - TOXIC EFFECTS CAN OCCUR BY SKIN ABSORPTION.

## SECTION III - PHYSICAL DATA

Physical state: LIQUID  
 Odor and appearance:  
 Odor threshold (ppm): .0380  
 pH:

Boiling Range: 277 - 424 F ( 136 - 217 C)

Vapor is heavier than Air.

Evaporation rate is slower than ether.

% Volatile (vol) 47.28 Lb/gal(U.S.) 8.90 SpGr: 1.06

## VOC Data Lb/Gal(U.S.):

Less Water (EPA)	3.56	Total Organic Solvents	3.56
Less Water & Exempt (EPA)	3.56	Total Non-Exempt Solvents	3.56

Solvent Density 7.52



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SECTION IV - FIRE AND EXPLOSION HAZARDS DATA

---

FP: (CLOSED) 86 F ( 30 C) LEL .99%

Flammability Class (OSHA): FLAMMABLE LIQUID - 1C

This is the OSHA classification, BOT may be different.

EXTINGUISHING MEDIA: Foam, Carbon Dioxide or Dry Chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During emergency conditions, overexposure to decomposition products (See Section VI - Reactivity Data) may cause a health hazard; symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIREFIGHTING PROCEDURES: Water may be ineffective in fighting fire. If water is used to cool closed containers to prevent pressure build-up, fog nozzles are preferred. Full protective equipment, including self-contained breathing apparatus is needed to protect firefighters from exposure to coating's hazardous ingredients and hazardous decomposition products.

---

SECTION V - HEALTH HAZARD DATA AND FIRST AID PROCEDURES

---

EFFECTS OF OVEREXPOSURE :

Skin : CAUSES SKIN IRRITATION. Other effects of skin contact may include : dermatitis, necrosis.

Eye : CAUSES EYE IRRITATION.

Inhalation : CAUSES NOSE AND THROAT IRRITATION. MAY CAUSE LUNG IRRITATION  
Other effects of inhalation may include : nausea, cough, shortness of breath, dehydration, dizziness, weakness, headache, drowsiness, fatigue, chest pain, vomiting.

Skin absorption : CAN BE ABSORBED THROUGH THE SKIN. Effects may include : headache, nausea, dizziness, weakness, incoordination, blood effects.

Ingestion : HARMFUL IF SWALLOWED. Other effects of ingestion may include : gastric disturbances, nausea, vomiting, diarrhea, weakness, headache, dizziness, fatigue, incoordination, blood effects.

PRIMARY ROUTE(S) OF ENTRY: inhalation, skin contact, ingestion, eyes.

MEDICAL CONDITIONS THAT CAN BE AGGRAVATED: pulmonary conditions, skin disorders.

CHRONIC HEALTH HAZARDS:

Repeated OVEREXPOSURE to this product may cause: central nervous system damage, kidney damage, liver abnormalities, lung damage, cardiac abnormalities, blood effects, eye damage.

Caution: Contains a melamine-formaldehyde resin which, under certain

conditions, could release formaldehyde in quantities sufficient to require monitoring under OSHA regulations. Formaldehyde is a suspect carcinogen.

**NOTICE:** Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

\*\*\*\*\*EMERGENCY AND FIRST AID PROCEDURES\*\*\*\*\*

**SKIN CONTACT:** Flush with plenty of water. Remove contaminated clothing and wash before reuse. Remove and destroy contaminated shoes.

**EYE CONTACT:** Flush with water for at least 15 minutes and get medical attention.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

**INGESTION:** Get medical attention IMMEDIATELY.

---

SECTION VI - REACTIVITY DATA

---

Material is STABLE under non-emergency conditions.

Material WILL NOT undergo hazardous polymerization.

**HAZARDOUS DECOMPOSITION PRODUCTS:** oxides of carbon, oxides of nitrogen, toxic fumes, various hydrocarbons, ammonia, formaldehyde, methanol, aluminum oxide, styrene, allyl alcohol, nitrogen compounds, ethanol.

**CONDITIONS TO AVOID:** temperatures above 120 degrees, open flame, sparks, water, moisture, dusty conditions.

**MATERIALS TO AVOID:** alkali, acids, oxidizers, water, aldehydes, isocyanates, halogen compounds, phosphorus, hydrogen peroxide, esters, nitrates, nitrites, bromine, organic halides.

---

SECTION VII - SPILL AND LEAK PROCEDURES

---

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Wear appropriate safety equipment as listed in Section VIII; assume for all hazardous ingredients listed in Section II, that the TLV, PEL and LEL limits will be exceeded. Absorb on inert material and dispose of as below.

**WASTE DISPOSAL METHODS:** Dispose of in accordance with FEDERAL, STATE and local regulations. Incineration is the preferred method of disposal.

---

SECTION VIII - SAFE HANDLING AND USE INFORMATION

---

**RESPIRATORY PROTECTION:** Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during application and handling unless air monitoring demonstrates vapor/mist levels below applicable limits. Follow respirator manufacturer's recommendations for selection and use.

**VENTILATION:** Sufficient ventilation must be provided to maintain airborne concentrations below TLV, PEL and LEL limits as listed in Section II.

**PROTECTIVE GLOVES:** Chemical resistant protective gloves should be worn when handling this product. Check with glove manufacturer to determine proper glove type.

**EYE PROTECTION:** Splash-proof chemical goggles should be worn.

**OTHER PROTECTIVE EQUIPMENT:** Eye bath and safety shower should be provided. Rubber apron should be worn.

**HYGIENIC PRACTICES:** Good personal hygiene practices are required at all times when handling chemicals. These practices include, but are not limited to, washing when safety equipment is removed, at the end of each shift or when going on breaks and especially if contamination occurs.

---

SECTION IX - SPECIAL PRECAUTIONS

---

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Store in well-ventilated area. All equipment should be grounded. Keep containers closed when not in use. Store in a clean, dry area. Store below 120 degrees Fahrenheit. Store away from ignition sources. Store away from open flame. Keep away from moisture-water. Avoid dusty conditions.

**OTHER PRECAUTIONS:** All precautions must be observed. Empty container may retain product residues.

This product contains the following SARA Title III, Section 313, reportable materials: xylene (mixed isomers), aluminum, glycol ether, naphthalene.

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SECTION X - OTHER INFORMATION

---

The absence of a positive finding indicates that we believe, to the best of our knowledge, that the negative is true.

**Disclaimer:** While Akzo Nobel Coatings Inc. believes that the data contained herein are accurate and derived from qualified sources, the data are not to be taken as a warranty or representation for which Akzo Nobel Coatings Inc. assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State and local laws and regulations.

## DOT Proper Shipping Classification -

## ABBREVIATIONS USED IN PREPARING THIS MSDS :

HMIS - Workplace Hazardous Materials Information System

TSCA - Toxic Substances Control Act

CFR - Code of Federal Regulations

mg/M3 - Milligrams per Meter Cubed

LEL - Lower Explosion Limit

FP - Flash Point

Lb/gal - Pounds Per Gallon

NA - Not Available or Non-applicable

mg/L - Milligrams Per liter

ppm - Parts Per Million

mm/Hg - Millimeters of Mercury

F - Fahrenheit

&gt; - Greater Than &lt; - Less Than

% - Percent

# - Pounds

CAS No - Chemical Abstract Number

HMIS - Hazardous Material Information System

ORAL-LD50 - Oral Lethal Dose (50% Death)

INHAL-LC50 - Inhalation Lethal Concentration (50% Death)

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SARA - Superfund Amendments &amp; Reauthorization Act (1986)

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**MATERIAL SAFETY  
DATA SHEET**

24-HOUR EMERGENCY TELEPHONE (606) 324-1133

002179

TRIDECYL ALCOHOL

PAGE: 1

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

\*\*\*\*\*

PRODUCT NAME: TRIDECYL ALCOHOL **BASF Tube Ink Reducer 87E-2152**
 INMONT CORPORATION  
4000 W. 40TH ST.  
CHICAGO

IL 60632

 05 50 021 4558670-001  
DATA SHEET NO: 0000016-002  
LATEST REVISION DATE: 03/86-86063  
PRODUCT: 3977000  
INVOICE: 904230  
INVOICE DATE: 03/13/86  
TO: SAME

ATTN: PLANT MGR./SAFETY DIR.

 -----  
SECTION I-PRODUCT IDENTIFICATION  
-----

GENERAL OR GENERIC ID: FATTY ALCOHOL

DOT HAZARD CLASSIFICATION: NOT APPLICABLE

 -----  
SECTION II-COMPONENTS  
-----

INGREDIENT	% (BY WT)	PEL	TLV	NOTE
TRIDECYL ALCOHOL	100			( 1 )

( 1 ): PEL/TLV NOT ESTABLISHED FOR THIS MATERIAL

 -----  
SECTION III-PHYSICAL DATA  
-----

PROPERTY	REFINEMENT	MEASUREMENT
BOILING POINT	FOR PRODUCT	487.00 - 505.00 DEG F ( 252.77 - 262.77 DEG C ) 9 760.00 MMHG
VAPOR PRESSURE	FOR PRODUCT	< 5.00 MMHG 9 68.00 DEG F ( 20.00 DEG C )
SPECIFIC VAPOR DENSITY		HEAVIER THAN AIR
SPECIFIC GRAVITY		0.841 - 0.846 9 77.00 DEG F ( 25.00 DEG C )
PERCENT VOLATILES	NOT APPLICABLE	
EVAPORATION RATE	(N-BUTYL ACETATE = 1)	< .05

 -----  
SECTION IV-FIRE AND EXPLOSION INFORMATION  
-----

FLASH POINT(PMCC ) 260.00 DEG F  
( 126.66 DEG C )

EXPLOSIVE LIMIT UNAVAILABLE

EXTINGUISHING MEDIA: REGULAR FOAM OR WATER FOG OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS:, CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, ETC.

FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WHEN FIGHTING FIRES.

SPECIAL FIRE & EXPLOSION HAZARDS: NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

 -----  
SECTION V-HEALTH HAZARD DATA  
-----

PERMISSIBLE EXPOSURE LEVEL: NOT ESTABLISHED.

EFFECTS OF ACUTE OVEREXPOSURE: FOR PRODUCT

EYES - CAN CAUSE MODERATE IRRITATION, REDNESS, TEARING.

SKIN - CAN CAUSE SLIGHT IRRITATION.

BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.

SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA.

FIRST AID:

IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDRY CONTAMINATED CLOTHING BEFORE RE-USE.

IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY, GET MEDICAL ATTENTION.

MATERIAL SAFETY  
DATA SHEET

24-HOUR EMERGENCY TELEPHONE (606) 324-1133

002179

TRIDECYL ALCOHOL

PAGE: 2

## SECTION V-HEALTH HAZARD DATA (CONTINUED)

IF SWALLOWED: IMMEDIATELY DRINK TWO GLASSES OF WATER AND INDUCE VOMITING BY EITHER GIVING IPECAC SYRUP OR BY PLACING FINGER AT BACK OF THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION IMMEDIATELY.

IF BREATHED: REMOVE INDIVIDUAL TO FRESH AIR.

## SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH: , STRONG, OXIDIZING AGENTS.

## SECTION VII-SPILL OR LEAK PROCEDURES

## STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

LARGE SPILL: ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIKE AREA OF SPILL TO PREVENT SPREADING, PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS.

## WASTE DISPOSAL METHOD:

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DISPOSE OF REMAINING MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

LARGE SPILL: DESTROY BY LIQUID INCINERATION. CONTAMINATED ABSORBENT MAY BE DEPOSITED IN A LANDFILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

## SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW LEVEL OF OVEREXPOSURE (FROM KNOWN, SUSPECTED OR APPARENT ADVERSE EFFECTS).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS: , NEOPRENE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER)

OTHER PROTECTIVE EQUIPMENT: NORMAL WORK CLOTHING COVERING ARMS AND LEGS.

## SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATASHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.



# MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY TELEPHONE (606) 324-1133

## DEFINITIONS

THIS DEFINITION PAGE IS INTENDED FOR USE WITH MATERIAL SAFETY DATA SHEETS SUPPLIED BY ASHLAND OIL, INC. AND ITS DIVISIONS. RECIPIENTS OF THESE DATA SHEETS SHOULD CONSULT THE OSHA SAFETY AND HEALTH STANDARDS (29 CFR 1910), PARTICULARLY SUBPART C - OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL, AND SUBPART I - PERSONAL PROTECTIVE EQUIPMENT, FOR GENERAL GUIDANCE ON CONTROL OF POTENTIAL OCCUPATIONAL HEALTH AND SAFETY HAZARDS.

### SECTION I PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: CHEMICAL FAMILY OR PRODUCT DESCRIPTION.

DOT HAZARD CLASSIFICATION: PRODUCT MEETS DOT CRITERIA FOR HAZARDS LISTED.

### SECTION II COMPONENTS

COMPONENTS ARE LISTED IN THIS SECTION IF THEY PRESENT A PHYSICAL OR HEALTH HAZARD AND ARE PRESENT AT OR ABOVE 1% IN THE MIXTURE. COMPONENTS IDENTIFIED AS CARCINOGENS BY NTP, IARC AND OSHA ARE LISTED AND FOOTNOTED IF THEY ARE PRESENT AT OR ABOVE 0.1% IN THE MIXTURE. OTHER COMPONENTS MAY BE LISTED IF DEEMED APPROPRIATE.

IDENTITIES OF COMPONENTS LISTED GENERALLY ARE DECLARED TRADE SECRET.

EXPOSURE RECOMMENDATIONS ARE FOR COMPONENTS. OSHA PERMISSIBLE EXPOSURE LIMITS (PELS) AND AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH) THRESHOLD LIMIT VALUES (TLVs) APPEAR ON THE LINE WITH THE COMPONENT IDENTIFICATION. OTHER RECOMMENDATIONS APPEAR AS FOOTNOTES.

### SECTION III PHYSICAL DATA

BOILING POINT: OF PRODUCT IF KNOWN. THE LOWEST VALUE OF THE COMPONENTS IS LISTED FOR MIXTURES.

VAPOR PRESSURE: OF PRODUCT IF KNOWN. THE HIGHEST VALUE OF THE COMPONENTS IS LISTED FOR MIXTURES.

SPECIFIC VAPOR DENSITY: COMPARED TO AIR = 1. IF SPECIFIC VAPOR DENSITY OF PRODUCT IS NOT KNOWN, THE VALUE IS EXPRESSED AS LIGHTER OR HEAVIER THAN AIR.

SPECIFIC GRAVITY: COMPARED TO WATER = 1. IF SPECIFIC GRAVITY OF PRODUCT IS NOT KNOWN, THE VALUE IS EXPRESSED AS LESS THAN OR GREATER THAN WATER.

PH: IF APPLICABLE.

PERCENT VOLATILES: PERCENTAGE OF MATERIAL WITH INITIAL BOILING POINT BELOW 425 DEGREES FAHRENHEIT.

EVAPORATION RATE: INDICATED AS FASTER OR SLOWER THAN ETHYL ETHER, UNLESS OTHERWISE STATED.

### SECTION IV FIRE AND EXPLOSION INFORMATION

FLASH POINT: METHOD IDENTIFIED.

EXPLOSION LIMITS: FOR PRODUCT IF KNOWN. THE LOWEST VALUE OF THE COMPONENTS IS LISTED FOR MIXTURES.

HAZARDOUS DECOMPOSITION PRODUCTS: KNOWN OR EXPECTED HAZARDOUS PRODUCTS RESULTING FROM HEATING, BURNING, OR OTHER REACTIONS.

EXTINGUISHING MEDIA: FOLLOWING NATIONAL FIRE PROTECTION ASSOCIATION CRITERIA.

### SECTION IV (CONT.)

FIREFIGHTING PROCEDURES: MINIMUM EQUIPMENT TO PROTECT FIREFIGHTERS FROM TOXIC PRODUCTS OF VAPORIZATION, COMBUSTION OR DECOMPOSITION IN FIRE SITUATIONS. OTHER FIREFIGHTING HAZARDS MAY ALSO BE INDICATED.

SPECIAL FIRE AND EXPLOSION HAZARDS: STATES HAZARDS NOT COVERED BY OTHER SECTIONS.

NEPA CODES: HAZARD RATINGS ASSIGNED BY THE NATIONAL FIRE PROTECTION ASSOCIATION.

### SECTION V HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMIT: FOR PRODUCT.

THRESHOLD LIMIT VALUE: FOR PRODUCT.

EFFECTS OF ACUTE OVEREXPOSURE: POTENTIAL LOCAL AND SYSTEMIC EFFECTS DUE TO SINGLE OR SHORT TERM OVEREXPOSURE TO THE EYES AND SKIN OR THROUGH INHALATION OR INGESTION.

EFFECTS OF CHRONIC OVEREXPOSURE: POTENTIAL LOCAL AND SYSTEMIC EFFECTS DUE TO REPEATED OR LONG TERM OVEREXPOSURE TO THE EYES AND SKIN OR THROUGH INHALATION OR INGESTION.

FIRST AID: PROCEDURES TO BE FOLLOWED WHEN DEALING WITH ACCIDENTAL OVEREXPOSURES.

PRIMARY ROUTE OF ENTRY: BASED ON PROPERTIES AND EXPECTED USE.

### SECTION VI REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CONDITIONS TO AVOID TO PREVENT HAZARDOUS POLYMERIZATION RESULTING IN A LARGE RELEASE OF ENERGY.

STABILITY: CONDITIONS TO AVOID TO PREVENT HAZARDOUS OR VIOLENT DECOMPOSITION.

INCOMPATIBILITY: MATERIALS AND CONDITIONS TO AVOID TO PREVENT HAZARDOUS REACTIONS.

### SECTION VII SPILL OR LEAK PROCEDURES

REASONABLE PRECAUTIONS TO BE TAKEN AND METHODS OF CONTAINMENT, CLEAN-UP AND DISPOSAL. CONSULT FEDERAL, STATE AND LOCAL REGULATIONS FOR ACCEPTED PROCEDURES AND ANY REPORTING OR NOTIFICATION REQUIREMENTS.

### SECTION VIII PROTECTIVE EQUIPMENT TO BE USED

PROTECTIVE EQUIPMENT WHICH MAY BE NEEDED WHEN HANDLING THE PRODUCT.

### SECTION IX SPECIAL PRECAUTIONS OR OTHER COMMENTS

COVERS ANY RELEVANT POINTS NOT PREVIOUSLY MENTIONED.

### ADDITIONAL COMMENTS

CONTAINERS SHOULD BE EITHER RECONDITIONED BY CERTIFIED FIRMS OR PROPERLY DISPOSED OF BY APPROVED FIRMS. DISPOSAL OF CONTAINERS SHOULD BE IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS. "EMPTY" DRUMS SHOULD NOT BE GIVEN TO INDIVIDUALS. SERIOUS ACCIDENTS HAVE RESULTED FROM THE MISUSE OF "EMPTIED" CONTAINERS (DRUMS, PAILS, ETC.). REFER TO SECTIONS IV AND IX.

# MATERIAL SAFETY DATA SHEET

## FOR PRINTING INK AND RELATED MATERIALS

INFORMATION ON THIS FORM IS PROPRIETARY INFORMATION AND FURNISHED  
SOLELY FOR THE USE OF OUR CUSTOMERS

REF 10-23-85

PREPARED BY P. Voedisch

### HAZARD RATINGS

Minimal..... 0  
Slight..... 1  
Moderate..... 2  
Serious..... 3  
Severe..... 4

HEALTH	1
FLAMMABILITY	1
REACTIVITY	0

## Section I

MANUFACTURER'S NAME: Dyal Products Inc.

BASF Non-Scratch Compound 87E-538

STREET ADDRESS: 1125 National Ave.

CITY, STATE AND ZIP CODE:

EMERGENCY TELEPHONE NUMBER: 312-628-1000

PRODUCT CLASS: Printing Ink Wax Compound (Polyolefin Type)

TRACE NAME:

MANUFACTURER'S CODE IDENTIFICATION: C-393

## Section II - HAZARDOUS INGREDIENTS

Ingredient:

Hazard Data:

Tridecyl Alcohol

Combustible Material

\* Exempt from OSHA Special labeling  
requirements as outlined in  
1910.1200 (d) (5) (iv)

## Section III - PHYSICAL DATA

BOILING RANGE °F 485-505	VAPOR DENSITY: HEAVIER <input checked="" type="checkbox"/> vs. air LIGHTER <input type="checkbox"/>	LIQUID DENSITY: HEAVIER <input type="checkbox"/> vs. water LIGHTER <input checked="" type="checkbox"/>	TYPE OF ODOR Higher Alcohol
APPEARANCE Off White-Paste	EVAPORATION RATE FASTER <input type="checkbox"/> vs. Butyl Acetate SLOWER <input checked="" type="checkbox"/>	PERCENT VOLATILE WT. 60-65	

## Section IV - FIRE & EXPLOSION DATA

FLAMMABILITY CLASSIFICATION OSHA Class III B DOT Not Regulated	FLASH POINT °F (Method Used) 260	LEL No Data
--	-------------------------------------	----------------

EXTINGUISHING MEDIA:

X F "ALCOHOL" FOAM X CO2 X DRY CHEMICAL X WATER FOG X OTHER

USUAL FIRE AND EXPLOSION HAZARDS

Keep containers tightly closed. Isolate from heat and open flame.

SPECIAL FIREFIGHTING PROCEDURES Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure build-up and possible auto-ignition when exposed to extreme heat. If used, fog nozzles are preferable.



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## Section V - HEALTH HAZARD DATA

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### EFFECTS OF OVEREXPOSURE

Excessive inhalation may cause headache, dizziness, drowsiness and nausea. Because of its defatting action on skin the solvent in this product may cause irritation and dermatitis. Eye irritation is also possible.

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### PRIMARY ROUTE(S) OF ENTRY:

☒ DERMAL

☐ INHALATION

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### EMERGENCY AND FIRST AID PROCEDURES

Inhalation: Remove from exposure, restore breathing, call physician  
Eyes: Flush with water for 15 minutes. Call physician  
Skin: Wash with soap and water, remove contaminated clothing

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## Section VI - REACTIVITY DATA

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### PRODUCT STABILITY

☒ STABLE

☐ UNSTABLE

CONDITIONS TO AVOID Heat, sparks and open flame.

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## Section VII - SPILL OR LEAK PROCEDURES

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### PROCEDURE WHEN MATERIAL SPILLED OR RELEASED

Remove all sources of ignition. Avoid breathing of concentrated vapors. Ventilate area. Add absorbant and scoop into disposal container. Wash or steam clean area.

### WASTE DISPOSAL METHOD

Landfill or incinerate in approved manner.

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## Section VIII - SPECIAL PROTECTION INFORMATION

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### VENTILATION

Provide general dilution or local exhaust ventilation on volume to keep oil mist below the PEL

### PROTECTIVE GLOVES

Required for prolonged or repeated contact. NIOSH approved respirators

### RESPIRATORY PROTECTION

if mist core is high

### EYE PROTECTION

Safety goggles or face mask

### OTHER PROTECTIVE EQUIPMENT

NONE

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## Section IX - SPECIAL PRECAUTIONS

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### HANDLING AND STORING

Store in sealed containers away from heat, sparks, and open flames and oxidizing materials. Fire extinguisher must be readily available and personnel trained in proper use.

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### OTHER PRECAUTIONS

Do not transfer to unmarked containers. Follow DOT regulations during transport.

Data sheet No.: _____		Date: _____	
Company <b>EIANLAKK A/S</b>		Commercial product name <b>IT 404-077</b>	
Address <b>P.O.Box 23 N-3051 Mjøndalen NORWAY</b>		Use <b>SPRAY LACQUER FOR TUBES</b>	
		Responsible person <b>Kjell Lange</b>	

### 1. CLASSIFICATION / LABELLING

<b>Symbols</b>  <b>HARMFUL</b>		<b>R-phrases</b> R-20/21/22 Harmful by inhalation, in contact with skin and if swallowed R-36/37/38 Irritating to eyes, respiratory system and skin  <b>S-phrases</b> S-38 In case of insufficient ventilation, wear suitable respiratory equipment S-24/25 Avoid contact with skin and eyes.
*OAR-group	4	
*OAR-figure	2 014	

### 2. TRANSPORT CLASSIFICATION

UN	MDG	ADR/RID	ICAO/IATA	ACEPIC
1263	3.3 page 3149	3,31(C)	—	395-30 0 35

### 3. COMPOSITION

	Weight %	Hazard Class	T.L.V.
HEXAN	10-30 %	Xn	100
2-(2-ETHOXYETHOXY)-ETHANOL	10-30 %	Xi	100
1-METHOXY-2-PROPANOL, ACETATE	1-5 %	Xi	100
1-METHOXY-2-PROPANOL	10-30 %	Xi	100
2-METHYL-1-PROPANOL	1-5 %	Xn	50

### 4. PHYSICAL DATA

<b>Colour/Smell</b> CLEAR YELLOW LIQUID, ODOUR OF SOLVENT			
<b>Physical State/Consistency</b> <input type="checkbox"/> SOLID (lumps, road) <input type="checkbox"/> POWDER <input type="checkbox"/> PASTE <input checked="" type="checkbox"/> LIQUID <input type="checkbox"/> GAS <input type="checkbox"/> AEROSOL			
<b>Vapour pressure</b> ( °C) mmHg - kPa	<b>Solubility in water</b> 20 °C	<input checked="" type="checkbox"/> Not soluble <input type="checkbox"/> Partly soluble <input type="checkbox"/> Soluble <input checked="" type="checkbox"/> Soluble in organic solvents	
<b>S.G. of vapour</b> (air=1)	<b>Density</b> ( °C) 0,98 kg/m <sup>3</sup>	<b>Viscosity</b> 25 ± 3sek.	<b>pH (Cons.):</b> pH ( %): -
<b>Melting point/Range</b> °C	<b>Boiling point/Range</b> 107,0- 205,0 °C	<b>Other data</b>	
<b>Explosion limits</b> 0,6 - 11,3 Vol%	<b>Ignition temperature</b> 204,0 °C	<b>Flash point</b> 33,0 °C	<input checked="" type="checkbox"/> Methode Closed cup <input type="checkbox"/> Not known Open cup
<b>Reactivity</b>			

### 5. TOXICOLOGICAL DATA

LD <sub>50</sub>	
LC <sub>50</sub>	

\*OAR = Occupational Air Requirements According to Norwegian Regulations

# SAFETY DATA

W. R. GRACE & CO. - CONN.  
DEWEY AND ALMY CHEMICAL DIVISION  
HAYDEN AVENUE  
LINGTON, MA 02173

EMERGENCY PHONE NO. (617) 861-6600

## SECTION I - IDENTIFICATION

PRODUCT (TRADE) NAME: DAREX CMPD 313 (39.5-40.5)

General Chemical Description: Water-based sealant

## SECTION II-INGREDIENTS

Hazardous Ingredients	% by Weight	Maximum Exposure Value (ppm) (8 hour time-weighted average)	
		OSHA PEL*	ACGIH TLV**
ammonia (CAS#7664-41-7) (SARA Section 313 chemical)	below 0.5	(35 STEL)	25 (35 STEL)
zinc oxide	10 approx.	5 mg/M3 (10 mg/M3 STEL) (fume)	5 mg/M3 (10 mg/M3 STEL) (fume)

\* 29 CFR Section 1910.1000, July 1, 1991

\*\* 1991-1992 recommendation, American Conference of Governmental Industrial Hygienists

Other Ingredients	% by Weight
Water, rubber, resin, filler, pigment, and modifiers.	above 99.5
SARA Section 313	% Zinc by Weight
zinc compounds	8 approx.

## SECTION III-PHYSICAL DATA

Solubility in Water: water dilutable Specific Gravity (water=1): 1.1 approx.

Volatiles, including water (% by weight): 60 approx.  
Appearance and Odor: Gray liquid; odor of ammonia

## SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point: above 200°F (Cleveland Open Cup)

Extinguishing Media: Carbon dioxide, dry chemical, foam.

Combustion will result in the release of the usual decomposition products including oxides of carbon and nitrogen.

## SECTION V-REACTIVITY DATA

Product is stable; hazardous polymerization will not occur.

PREPARED 08/04/92

PAGE : 1 OF 3

DAREX CMPD 313 (39.5-40.5)

## -----SECTION VI-SPILL OR LEAK PROCEDURES-----

Handling Precautions: See Section VIII.

For small spills: Wipe up, or absorb with sand or other absorbent material. Collect waste in sealed containers.

For large spills: Dike area to prevent spreading. Shovel or pump to drum or salvage tank. Absorb residual material with sand, or other absorbent material.

Material is not a hazardous waste as defined in 40 CFR Sec. 261.3.

Dispose of all product wastes and water rinses in accordance with current local, state, and Federal regulations.

## -----SECTION VII-HEALTH HAZARD DATA-----

Threshold Limit Values: See Section II.

Signs & Symptoms of Acute ExposureEmergency First Aid Procedures

Inhalation: Ammonia vapors could produce irritation of nose and throat.

Remove to fresh air.

Eyes: Irritation upon direct contact.

Immediately flush eyes with water for at least 15 minutes; get medical attention.

Vapors can produce irritation.

Remove to fresh air; flush eyes with water.

Skin: Possible irritation.

Wash affected area with water; if irritation occurs and persists, get medical attention. Remove contaminated clothing.

Ingestion: Not known.

Dilute with water or milk; do not induce vomiting; get medical attention.

Chronic Effects: Prolonged overexposure to ammonia by inhalation can cause suffocation and pulmonary edema.

Medical Conditions Aggravated by Overexposure: Preexisting respiratory and skin diseases may be aggravated.

GET MEDICAL ATTENTION IF SYMPTOMS PERSIST

DAREX CMPD 313 (39.5-40.5)

## -----SECTION VIII-SPECIAL PRECAUTIONS-----

Handling and Storing

- Wear neoprene gloves if direct contact likely; wear eye protection.
- Avoid breathing vapors.
- Keep from freezing.

PREPARED 08/04/92

PAGE : 3 OF 3

GRACE

## SAFETY DATA

W. R. GRACE & CO., DEWEY AND ALMY CHEMICAL DIVISION  
HAYDEN AVENUE  
INGTON, MA 02173

EMERGENCY PHONE NO. (617) 861-6600

## SECTION I - IDENTIFICATION

PRODUCT (TRADE) NAME: DAREX CMPD B31F

General Chemical Description: Water-based sealant

## SECTION II - INGREDIENTS

Hazardous Ingredients	% by Weight	Maximum Exposure Value (ppm) (8 hour time-weighted average)	
		OSHA PEL*	ACGIH TLV**
ammonia	below 0.5	50	25
zinc oxide	9 approx.	5 mg/cubic meter (fume)	5 mg/cubic meter (fume)

\* 29 CFR Section 1910.1000, July 1, 1987

\*\* 1987-1988 recommendation, American Conference of Governmental Industrial Hygienists

Other Ingredients % by Weight

Water, rubber, resin, filler, pigment, and modifiers. above 90

SARA Section 313 % Zinc by Weight

zinc compounds 7 approx.

## SECTION III - PHYSICAL DATA

Solubility in Water: water dilutable Specific Gravity (water=1): 1.1 approx.

Volatiles, including water (% by weight): 66 approx.  
Appearance and Odor: Gray liquid; odor of ammonia

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: above 200°F (Cleveland Open Cup)

Extinguishing Media: Carbon dioxide, dry chemical, foam.

Combustion will result in the release of the usual decomposition products including oxides of carbon and nitrogen.

## SECTION V - REACTIVITY DATA

Product is stable; hazardous polymerization will not occur.

REPAIRED 01/26/89

PAGE : 1 OF 2

DAREX CMPD B31F

## -----SECTION VI-SPILL OR LEAK PROCEDURES-----

Handling Precautions: See Section VIII.

For small spills: Wipe up, or absorb with sand or other absorbent material. Collect waste in sealed containers.

For large spills: Dike area to prevent spreading. Shovel or pump to drum or salvage tank. Absorb residual material with sand, or other absorbent material.

Material is not a hazardous waste as defined in 40 CFR Sec. 261.3.

Dispose of all product wastes and water rinses in accordance with current local, state, and Federal regulations.

## -----SECTION VII-HEALTH HAZARD DATA-----

Threshold Limit Values: See Section II.

Signs & Symptoms of Acute ExposureEmergency First Aid Procedures

Inhalation: Ammonia vapors could produce irritation of nose and throat.

Remove to fresh air.

Eyes: Irritation upon direct contact.

Immediately flush eyes with water for at least 15 minutes; get medical attention.

Vapors can produce irritation.

Remove to fresh air; flush eyes with water.

Skin: Possible irritation.

Wash affected area with water; if irritation occurs and persists, get medical attention. Remove contaminated clothing.

Ingestion: Not known.

Dilute with water or milk; do not induce vomiting; get medical attention

GET MEDICAL ATTENTION IF SYMPTOMS PERSIST

## -----SECTION VIII-SPECIAL PRECAUTIONS-----

Handling and Storing

- Wear neoprene gloves if direct contact likely; wear eye protection.
- Avoid breathing vapors.
- Keep from freezing.

REPAIRED 01/26/89

PAGE : 2 OF 2

# SAFETY DATA

W. R. GRACE & CO., DEWEY AND ALMY CHEMICAL DIVISION  
55 HAYDEN AVENUE  
INGTON, MA 02173

EMERGENCY PHONE NO. (617) 861-6600

## SECTION I - IDENTIFICATION

PRODUCT (TRADE) NAME: DAREX CMPD 313 (39.5-40.5)

General Chemical Description: Water-based sealant

## SECTION II - INGREDIENTS

Hazardous Ingredients	% by Weight	Maximum Exposure Value (ppm)	
		(8 hour time-weighted average)	
		OSHA PEL*	ACGIH TLV**
ammonia	below 0.5	50	25
zinc oxide	10 approx.	5 mg/cubic meter (fume)	5 mg/cubic meter (fume)

\* 29 CFR Section 1910.1000, July 1, 1987

\*\* 1987-1988 recommendation, American Conference of Governmental Industrial Hygienists

Other Ingredients % by Weight

Water, rubber, resin, filler, pigment, and modifiers. above 99.5

OSHA Section 313 % Zinc by Weight

zinc compounds 8 approx.

## SECTION III - PHYSICAL DATA

Solubility in Water: water dilutable Specific Gravity (water=1): 1.12

Volatiles, including water (% by weight): 60 approx.  
Appearance and Odor: Gray liquid; odor of ammonia

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: above 200°F (Cleveland Open Cup)

Extinguishing Media: Carbon dioxide, dry chemical, foam.

Combustion will result in the release of the usual decomposition products including oxides of carbon and nitrogen.

## SECTION V - REACTIVITY DATA

Product is stable; hazardous polymerization will not occur.

REPAIRED 01/24/89

PAGE : 1 OF 2



# SAFETY DATA

DAREX CMPD 313 (39.5-40.5)

## SECTION VI-SPILL OR LEAK PROCEDURES

Handling Precautions: See Section VIII.

For small spills: Wipe up, or absorb with sand or other absorbent material. Collect waste in sealed containers.

For large spills: Dike area to prevent spreading. Shovel or pump to drum or salvage tank. Absorb residual material with sand, or other absorbent material.

Material is not a hazardous waste as defined in 40 CFR Sec. 261.3.

Dispose of all product wastes and water rinses in accordance with current local, state, and Federal regulations.

## SECTION VII-HEALTH HAZARD DATA

Threshold Limit Values: See Section II.

### Signs & Symptoms of Acute Exposure

### Emergency First Aid Procedures

Inhalation: Ammonia vapors could produce irritation of nose and throat.

Remove to fresh air.

Eyes: Irritation upon direct contact.

Immediately flush eyes with water for at least 15 minutes; get medical attention.

Vapors can produce irritation.

Remove to fresh air; flush eyes with water.

Skin: Possible irritation.

Wash affected area with water; if irritation occurs and persists, get medical attention. Remove contaminated clothing.

Ingestion: Not known.

Dilute with water or milk; do not induce vomiting; get medical attention

GET MEDICAL ATTENTION IF SYMPTOMS PERSIST

## SECTION VIII-SPECIAL PRECAUTIONS

### Handling and Storing

- Wear neoprene gloves if direct contact likely; wear eye protection.
- Avoid breathing vapors.
- Keep from freezing.

REPAIRED 01/24/89

PAGE : 2 OF 2

# SAFETY DATA

W. R. GRACE & CO., DEWEY AND ALMY CHEMICAL DIVISION  
55 Hayden Avenue  
Lexington, MA 02173

EMERGENCY PHONE NO. (617)861-6600

## SECTION I - IDENTIFICATION

PRODUCT (TRADE) NAME: DAREX Oilproof Compound W9113S

General Chemical Description: Water-based sealant

## SECTION II-INGREDIENTS

<u>Hazardous Ingredients</u>	<u>% by Weight</u>	<u>Maximum Exposure Value (ppm) (8 hour time-weighted average)</u>	
		<u>OSHA PEL*</u>	<u>ACGIH TLV**</u>
ammonia	less than 0.5	50	25

\* 29 CFR Section 1910.1000, July 1, 1984

\*\* 1985 recommendation, American Conference of Governmental Industrial Hygienists

<u>Non-hazardous Ingredients</u>	<u>% by Weight</u>
Water, rubber, resin, filler, plasticizer, pigment, and modifiers.	above 99

## SECTION III-PHYSICAL DATA

<u>Solubility in water:</u> water dilutable	<u>Specific Gravity (water=1):</u> 1.09
	<u>Volatiles (% by weight):</u> 60
<u>Appearance and Odor:</u> Gray liquid; odor of ammonia	

## SECTION IV-FIRE AND EXPLOSION HAZARD DATA

Flash Point: Non-flammable  
Extinguishing Media: Carbon dioxide, dry chemical, foam.

## SECTION V-REACTIVITY DATA

Product is stable; hazardous polymerization will not occur.

# SAFETY DATA

DAREX Oilproof Compound W9113S

## SECTION VI-SPILL OR LEAK PROCEDURES

Wipe up, or absorb with vermiculite or other absorbent material. Rinse area with water.

Dispose of all product wastes and water rinses in accordance with current local, state, and Federal regulations.

Material is not a hazardous waste as defined in 40 CFR Sec. 261.3.

## SECTION VII-HEALTH HAZARD DATA

Threshold Limit Values: See Section II.

### Effects of Overexposure

### Emergency First Aid Procedures

Inhalation: Ammonia vapors could produce irritation of nose and throat.

Remove to fresh air.

Eyes: Irritation upon direct contact.

Immediately flush eyes with water for at least 15 minutes; get medical attention.

Vapors can produce irritation.

Remove to fresh air; flush eyes with water.

Skin: Possible irritation.

Remove contaminated clothing; wash affected area with water.

Ingestion: None known.

GET MEDICAL ATTENTION IF SYMPTOMS PERSIST

## SECTION VIII-SPECIAL PRECAUTIONS

### Handling and Storing

- Wear eye protection if direct contact likely.
- Wear gloves and protective clothing if direct contact likely.
- Avoid breathing vapors.
- Keep from freezing.